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A summary assessment of fuel poverty in London in 2009 and scenarios to 2013

By **Simon Kyte**

MAYOR OF LONDON

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Methodology for the calculation of fuel poverty

The Mayor's preferred methodology for the calculation of fuel poverty in London is outlined in the 2008 paper commissioned by the GLA from the Association for the Conservation of Energy, the Centre for Sustainable Energy and Impetus Consulting, Fuel poverty in London: figures and tables illustrating the challenge of tackling fuel poverty (September 2008). The residual income measure used in that report was derived from the Mayor's Energy Strategy (2004) and is defined by the 2008 report as 'disposable income after housing costs' with the housing costs being updated using regional data on rents and mortgages for each tenure.

The report which follows uses a different methodology which is in line with that used by the Department for Energy and Climate Change (DECC) nationally except that it uses basic income rather than full income when calculating fuel poverty.

Executive Summary

In 2001, the Government published its Fuel Poverty Strategy for England in response to the Warm Homes and Energy Conservation Act, 2000. It set an interim objective of eradicating fuel poverty in vulnerable households - as far as reasonably practicable - by 2010. Furthermore, under the Warm Homes and Energy Conservation Act (2000), no household should be in fuel poverty - as far as reasonably practicable - by 2016. However, in spite of significant investment, the number of households assessed to be in fuel poverty has not fallen in line with targets and the latest official data from the Department of Energy and Climate Change (DECC) suggests that the incidence of fuel poverty has risen since 2004.

Publications by DECC report on the national situation. This paper examines the current state of fuel poverty in London. In following DECC's national approach to calculating fuel poverty (except in its use of basic, rather than full, income measure) this methodology is different to that used in the GLA's 2008 report by the Association for the Conservation of Energy, the Centre for Sustainable Energy and Impetus Consulting. The official DECC measure for fuel poverty (using full income) underestimates the incidence of fuel poverty in the capital due to the inclusion of housing-related benefits as income under that measure. Using a basic income measure in its place raises the incidence of fuel poverty in London from 13.3 per cent to 18.6 per cent. Furthermore, the actual numbers of households involved are very substantial, although the 12.9 per cent share of national households in fuel poverty is slightly less than London's share of English households. When severe fuel poverty is examined, there are more than 126,400 households in London falling within the definition. However, in the case of both fuel poverty and severe fuel poverty, there are significant numbers in the capital just beneath the threshold level (i.e. between 7.6 per cent and 10.0 per cent of basic income).

The paper also presents the results of some initial scenario building. These are based around alternative assumptions with regard to income growth and fuel prices. The results should not be taken as a 'forecast' of what will happen to fuel poverty in the capital. However, using simple modelled scenarios (based on different assumptions around income and fuel prices) suggests that the incidence of fuel poverty in London varies between 16 per cent and 24 per cent over the period to 2013.

Professor John Hills, Director of the Centre for Analysis of Social Exclusion, London School of Economics, has recently published the interim report of the Hills Fuel Poverty Review[1] commissioned by DECC. This paper hopes to contribute to the debate which is likely to follow[2].

[1] Fuel poverty: the problem and its measurement (CASE Report 69). See: http://www.decc.gov.uk/media/viewfile.ashx?filetype=4&filepath=11/funding-support/fuel-poverty/3226-fuel-poverty-review-interim-report.pdf&minwidth=true

[2] This paper notes the proposed change in definition of fuel poverty investigated within the Interim Report identifying those in fuel poverty as those whose required fuel costs exceeded the median level ***and***, were they to spend that amount, would be left with a residual income below the official poverty line. This would have the effect of creating far less variation in numbers in fuel poverty from one year to another. However, the paper continues to work with the existing definition.

Fuel poverty in London: Introduction

In 2001, the Government published its Fuel Poverty Strategy for England in response to the Warm Homes and Energy Conservation Act, 2000. It set an interim objective of eradicating fuel poverty in vulnerable households[3] - as far as reasonably practicable - by 2010. Furthermore, under the Warm Homes and Energy Conservation Act (2000), no household should be in fuel poverty - as far as reasonably practicable - by 2016.

However, in spite of significant investment, the number of households assessed to be in fuel poverty has not fallen in line with targets and the latest official data from the Department of Energy and Climate Change (DECC) suggests that the incidence of fuel poverty has risen since 2004.

For the purposes of this paper, fuel poverty is defined according to the national definition used by DECC's Annual Report on Fuel Poverty Statistics, 2011[4]. That is, a household is deemed to be in fuel poverty if it would require more than 10 per cent of its income to maintain an adequate level of warmth. 'An adequate level of warmth' is defined as heating one main room to a temperature of 21 degrees Centigrade and remaining rooms to 18 degrees Centigrade. It should be noted that the 'official' measurement therefore considers the fuel needed to attain this level of warmth; the 'official' measurement does not use information on actual fuel bills.

The 2008 GLA report commissioned from the Association for the Conservation of Energy, the Centre for Sustainable Energy and Impetus Consulting[5] used a bespoke methodology to calculate fuel poverty in London. In what follows, the current state of fuel poverty in London is considered by adopting the approach used by DECC with the exception of the income measure used. Whilst DECC's headline results use its 'full income' measure, the results reported in this paper use the 'basic income' measure. The main difference between the full and basic income measures is that the full income measure includes income from housing-related benefits whereas the basic income measure does not[6]. The reason for the use of the basic income measure is that full income includes housing-related benefits which, on account

[3] Vulnerable households are defined as those containing somebody aged 60 or over, below 16 or somebody who is ill or disabled. The definition is completely different from that used by DCLG and has been designed specifically for fuel poverty.
[4] Department of Energy and Climate Change – Annual report on fuel poverty statistics 2011. http://www.decc.gov.uk/assets/decc/statistics/fuelpoverty/2181-annual-report-fuel-poverty-stats-2011.pdf
[5] Fuel poverty in London: figures and tables illustrating the challenge of tackling fuel poverty (September 2008)
[6] The full details of the calculation of basic income are outlined in DECC's *Fuel poverty methodology handbook* (2010) but the steps of the calculation are summarised below:

1) Income from private sources;
2) Add on income from benefits and tax credits;
3) Convert private income sources provided as *net* to *gross;*
4) Deduct income tax and NICs payable;
5) Add on income from savings and investments;
6) Bring lone parents and pensioners up to at least basic Income Support;
7) Impute missing values;
8) Add on income from other benefit units;
9) Add winter fuel payments to those eligible.

In order to transform basic income to full income: income from housing-related benefits and from Mortgage Payment Protection Insurance and Support for Mortgage Interest are added and Council Tax deducted from all households.

of housing costs in the capital, artificially inflate income and therefore reduce the incidence of fuel poverty in London. As a result, the results from this report are therefore not directly comparable with headline figures published by DECC. Much of the second half of the paper presents simple modelled scenarios for what might happen to fuel poverty in the capital over the next few years.

This work, as with the analysis by DECC, uses detailed data from the English Housing Survey 2009-2010 (which has replaced the English Housing Conditions Survey) as the source for much of the data. Quoted data on numbers of households are rounded to the nearest 100 households. For future projections for London, household numbers from GLA Intelligence rather than those from the Department for Communities and Local Government (CLG) have been used.

1. The incidence of fuel poverty amongst households in London

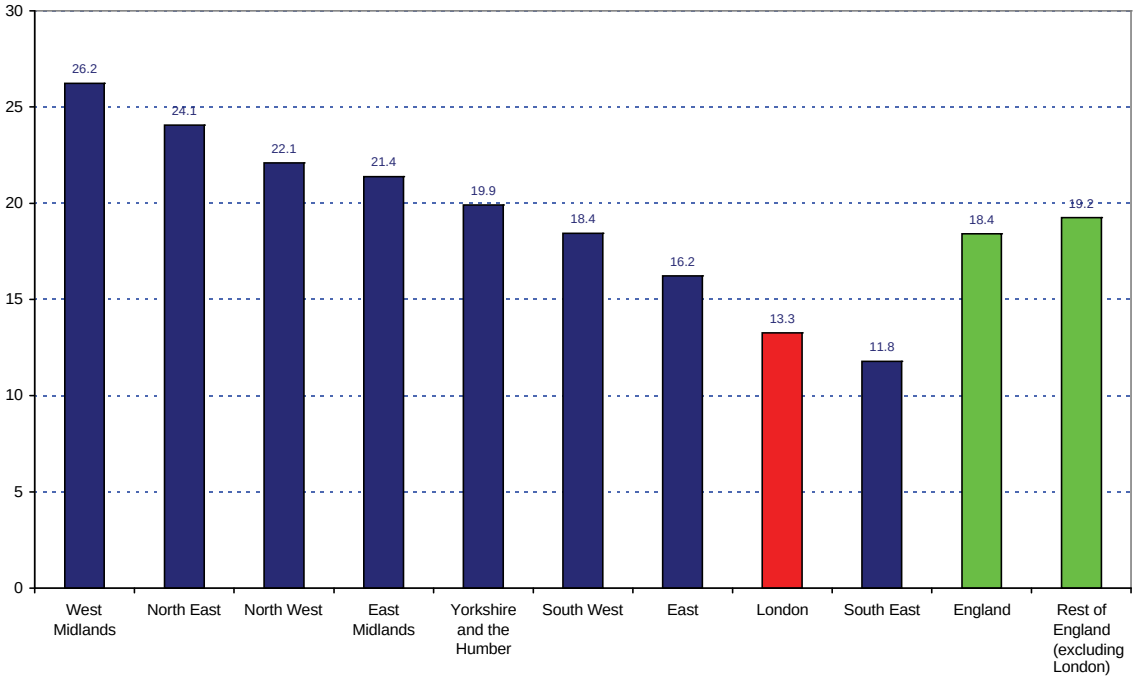
The English Household Survey (EHS) is a continuous, national survey which is commissioned by the Department for Communities and Local Government (CLG) but which also contains DECC's fuel poverty dataset. It collects data on people's household circumstances across England as well as the condition and energy efficiency of housing. It has three main components: a household interview, a physical inspection and a market value survey of a sub-sample of the dataset. It replaced two previous surveys: the English Housing Conditions Survey and the Survey of English Housing[7]. The sample sizes involved in the EHS are just under 8,000 nationally and just under 1,000 in the capital.

This paper uses regional information from the EHS and DECC's own fuel poverty identifiers[8] and proportions of basic income required to maintain adequate warmth. This analysis indicates that 562,800 households in the capital are in fuel poverty according to the basic income definition. This equates to 18.6 per cent of all London households which is slightly below the comparable proportion for England as a whole (20.3 per cent). It is also below the comparable proportions for Northern and Midland regions but higher than the capital's neighbouring regions of the East of England and the South East. The effect of not having used the full income measure can be seen in Figures 1 and 2 below. All regions record a higher level of fuel poverty incidence in 2009 than they did in 2008 when 15.6 per cent of households in the capital were in fuel poverty on the basic income measure (and 10.8 per cent on the full income measure).

[7] The amalgamation of the English Housing Conditions Survey and the Survey of English Households into the English Housing Survey had the effect of increasing the proportion of single person households in the sample relative to the old English Housing Conditions Survey slightly. This will have exerted a slight upward pressure on fuel poverty because a greater proportion of single households are fuel poor.

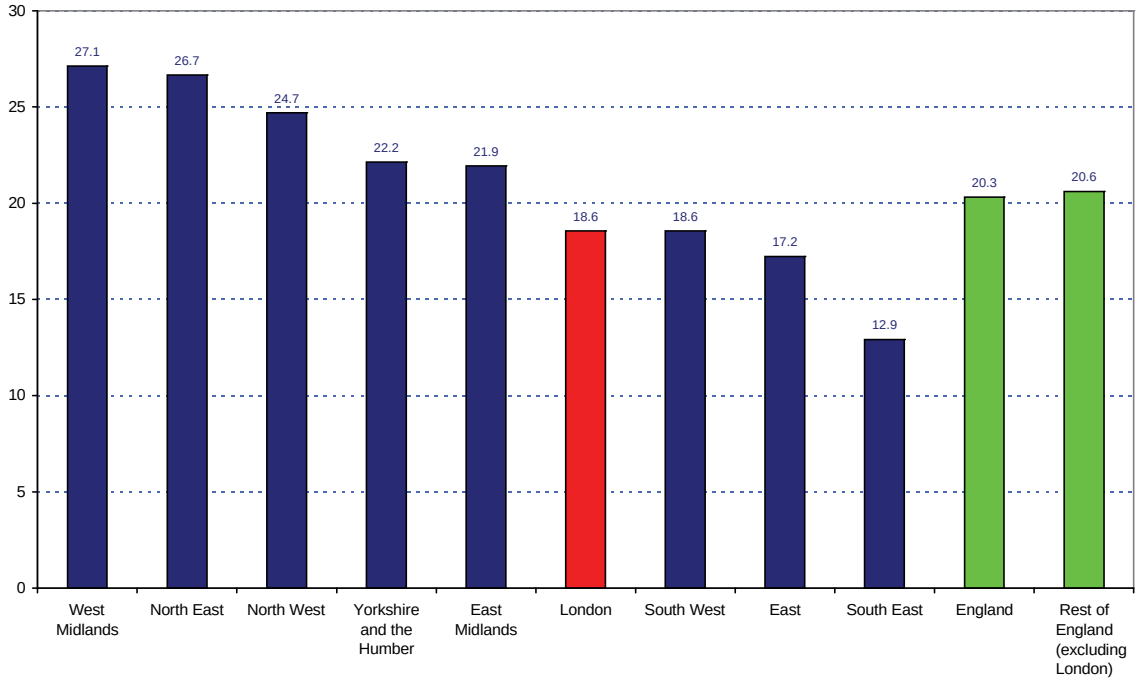
[8] That is households identified by DECC itself as being in fuel poverty on either of the two main income definitions.

Figure 1: The incidence of fuel poverty on the full income measure (Percentage of all households in region, 2009)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

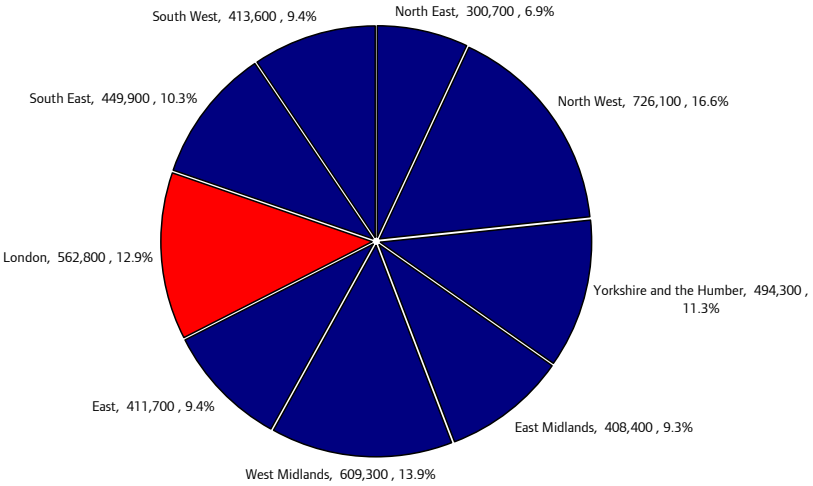
Figure 2: The incidence of fuel poverty on the basic income measure (Percentage of all households in region, 2009)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

London's 562,800 households in fuel poverty equate to 12.9 per cent of all households in England in fuel poverty – less than London's share of England's households and its share of national population. The region with the highest share is the North West which accounts for around 16.6 per cent of all English households in fuel poverty as shown in Figure 3.

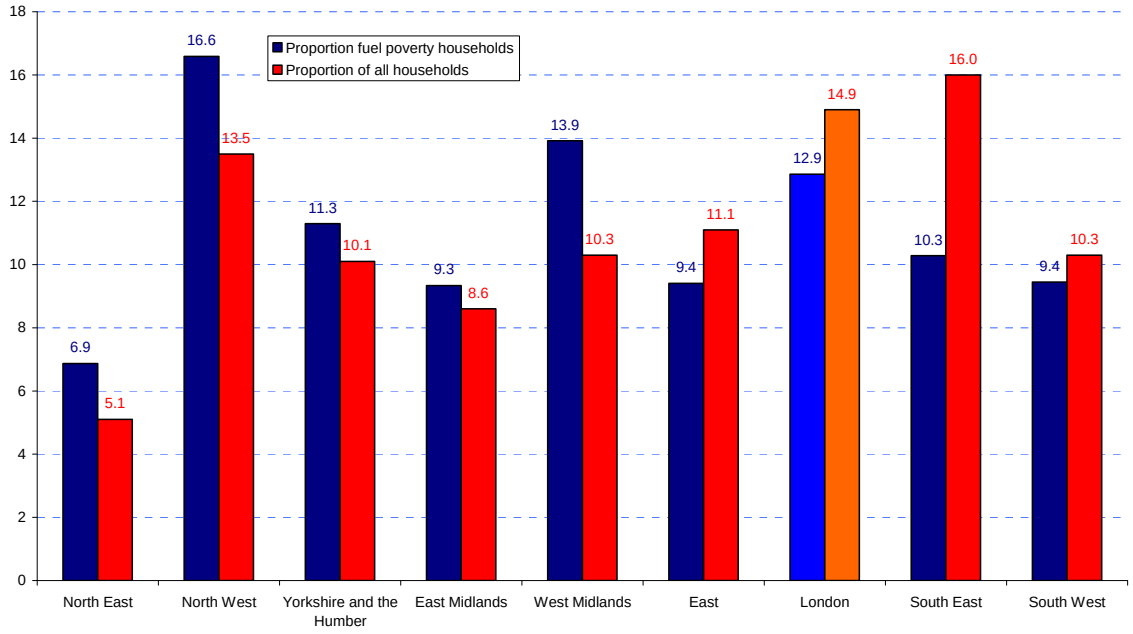
Figure 3: Number of households in fuel poverty (on basic income definition) by region and share of households in fuel poverty across England (2009)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

For comparison, Figure 4 provides a guide to the regional share of total households alongside the share of households in fuel poverty. Generally, regions in the North and Midlands have a higher share of England's fuel poverty households than they do of all households. The reverse is the case in the South.

Figure 4: Percentage share of households in England by region according to Communities & Local Government compared to the share of households in fuel poverty on the basic income measure (2009)

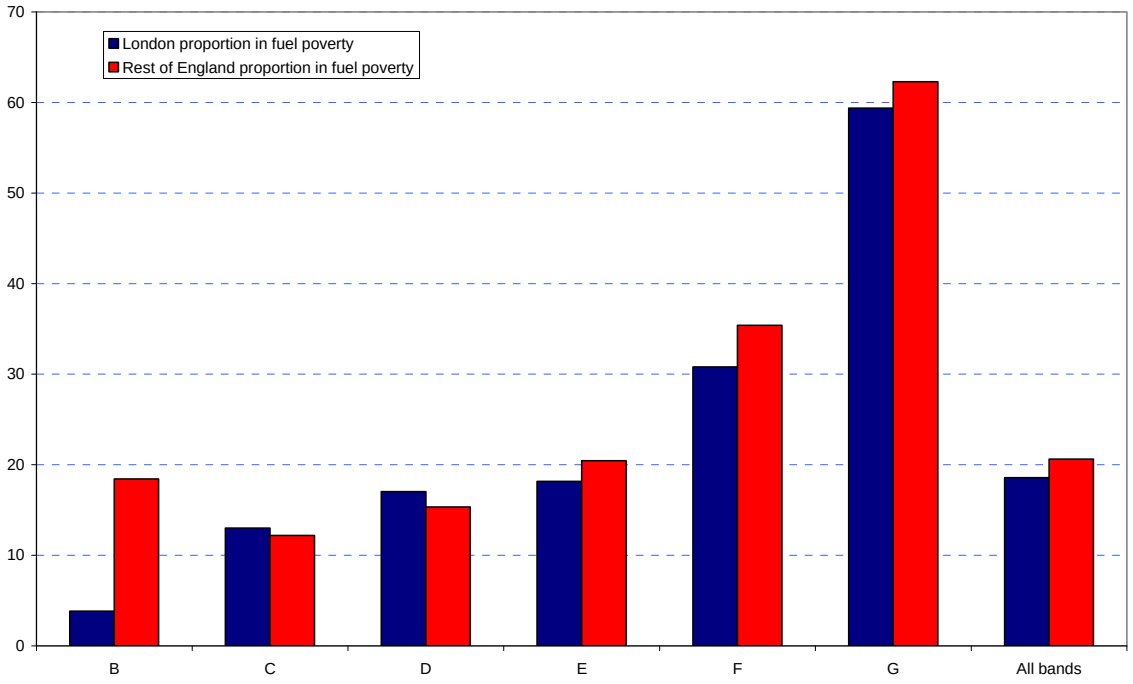


Source: Communities and Local Government (CLG), DECC Fuel Poverty Dataset, GLA Economics calculations

2. Fuel poverty and energy performance banding

There is a direct link between energy performance banding[9] and the proportion of households in fuel poverty. Generally, this relationship is visible both at the regional level and at the national level although the results for band B are less intuitive for the 'rest of England' than they are for the capital[10].

Figure 5: Proportion of households in each energy performance band in fuel poverty on the basic income measure – London and the rest of England (%, 2009)

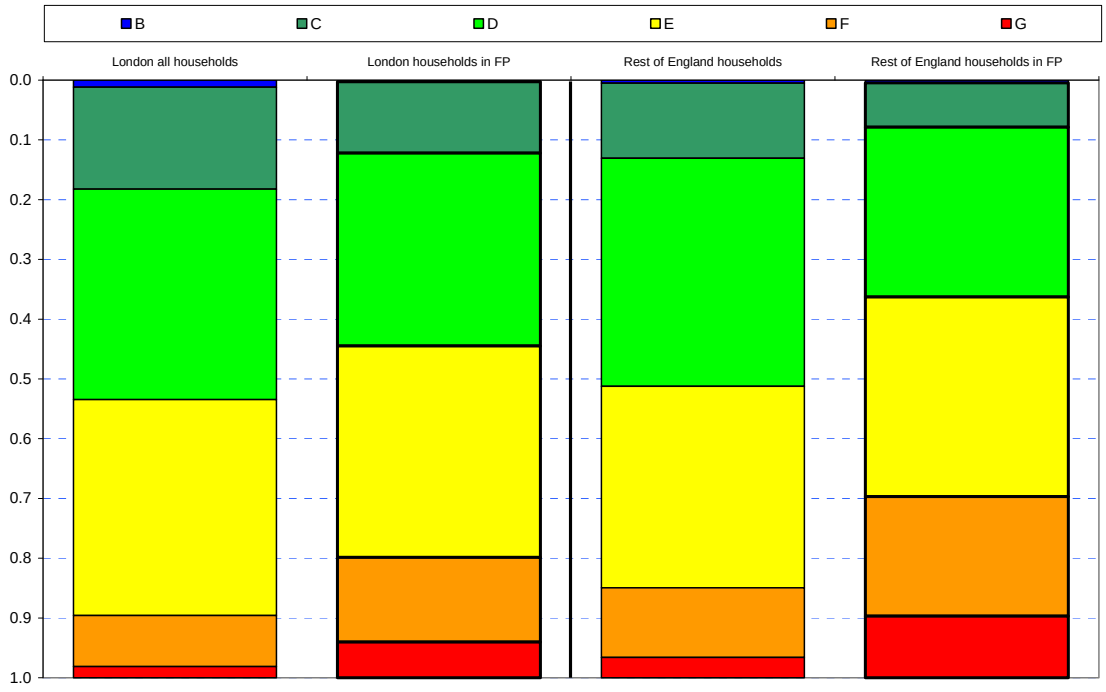


Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations[11]

In London 59.4 per cent of band G households are in fuel poverty compared to only 3.8 per cent in band B as shown in Figure 5. Attention should also be drawn to the fact that band G households make up a very small proportion of all London households (less than 2 per cent – and around 6 per cent of households in the capital in fuel poverty). Therefore another way of looking at these data is each band as a share of all households and as a share of all households in fuel poverty as shown in Figure 6.

[9] Homes are rated in terms of their energy use per unit of floor area and on energy efficiency. A is the most energy efficient banding although there are currently very few properties rated to this standard. G is the least energy efficient banding and is likely to have the highest running costs.
[10] The results for band B are actually based on rather small samples and skewed as most of the band's properties are social housing with relatively low incomes. Although their modelled bill is low, if incomes are also very low, they can still be fuel poor.
[11] Additional data relating to this graph can be found in Appendix 2.

Figure 6: Share of all households in London and in the rest of England in each energy performance band and share of all households in fuel poverty by energy performance band – basic income definition (2009)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations[12]

The key message from Figure 6 is that many households in fuel poverty in the capital (and this is also the case elsewhere in England) are not ones which are especially energy-inefficient. Forty-five per cent of households in fuel poverty in the capital are actually in the relatively energy efficient bands B to D.

It is important to appreciate that, except under some very extreme circumstances, whether a household is likely to be in fuel poverty or not is more likely to be determined primarily by its income and by fuel prices rather than by the housing stock's energy efficiency band.

[12] Additional data relating to this graph can be found in Appendix 2.

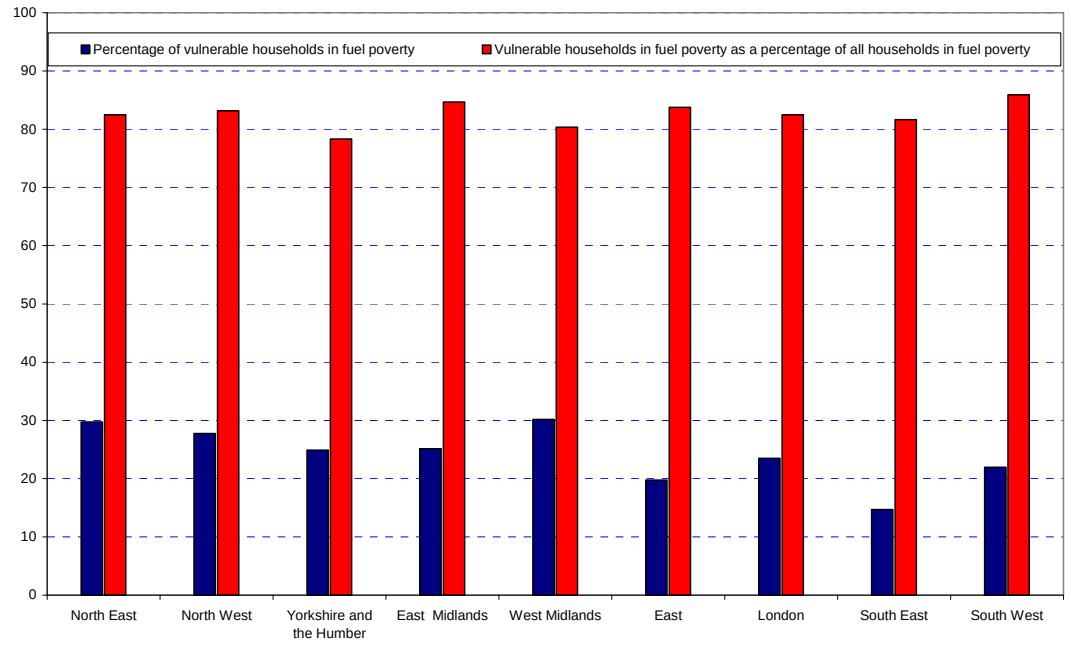
3. 'Vulnerable' households and older people in households in fuel poverty

A disproportionate share of households in fuel poverty is classified as 'vulnerable households' according to the definition used by DECC. Eighty-two per cent of fuel poverty households in the capital are vulnerable (464,100). Almost one in four vulnerable households (23.5 per cent) falls within the fuel poverty definition as opposed to only 9.4 per cent amongst non-vulnerable households. As shown in Figure 7 there are marked variations between regions with regard to vulnerable households in fuel poverty.

Figure 7: Vulnerable households in fuel poverty:

(i) Vulnerable households in fuel poverty as a percentage of all households in fuel poverty by region;

(ii) Percentage of vulnerable households in fuel poverty by region (2009).

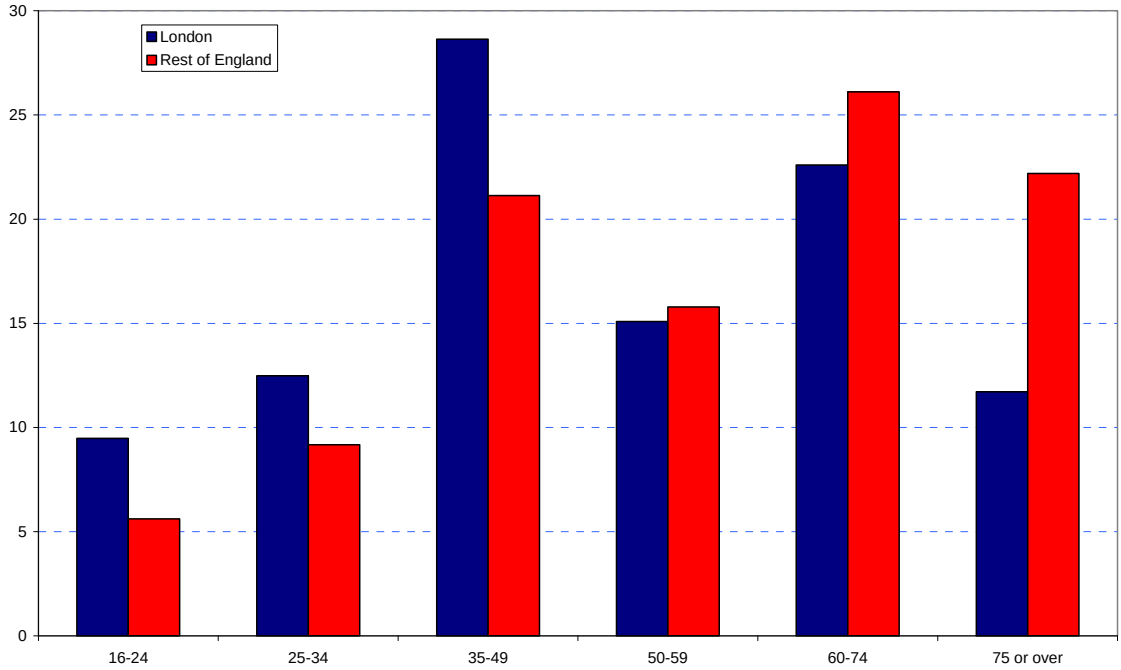


Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations[13]

With regard to households containing one or more elderly people, DECC has produced an analysis nationally which is reproduced here for London on a basic income basis. Figure 8 shows the share of fuel poverty in London and the rest of England by age of the oldest member of the household.

[13] Additional data relating to this graph can be found in Appendix 2.

Figure 8: London and national shares of fuel poverty by eldest member of household (Percentage of all fuel poor households, 2009)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations[14]

Therefore, on the basic income measure, households in which the eldest person is 60 or over account for only 34 per cent of all fuel poor households in the capital as opposed to nearly half in the Rest of England. As can be seen in Figure 8, the differences between London and the Rest of England are most pronounced where the eldest household member is aged 75 or over or between 35 and 49 years of age. This latter category is especially over-represented in London's fuel poverty profile.

The fuel poverty profile above has been compared to the overall distribution of households by age of eldest household member – both for London and for the rest of England. In Table 1, the ratios between the distributions is shown. For example, in London, the proportion of households in fuel poverty with the eldest member between 16 and 24 is twice the proportion accounted for by the 16 to 24 eldest member households in the overall distribution of households in the capital. A figure of less than 1 implies that the proportion accounted for by the cohort amongst fuel poverty households is less than would have been expected purely on the basis of the general distribution of households in the capital.

[14] Additional data relating to this graph can be found in Appendix 2.

Table 1: Ratio of proportion of fuel poverty households by age of eldest household member to the general distribution of households by cohort

	16-24	25-34	35-49	50-59	60-74	75 or over
London	2.0	0.6	0.7	1.1	1.5	1.5
Rest of England	1.7	0.7	0.5	0.9	1.1	1.7

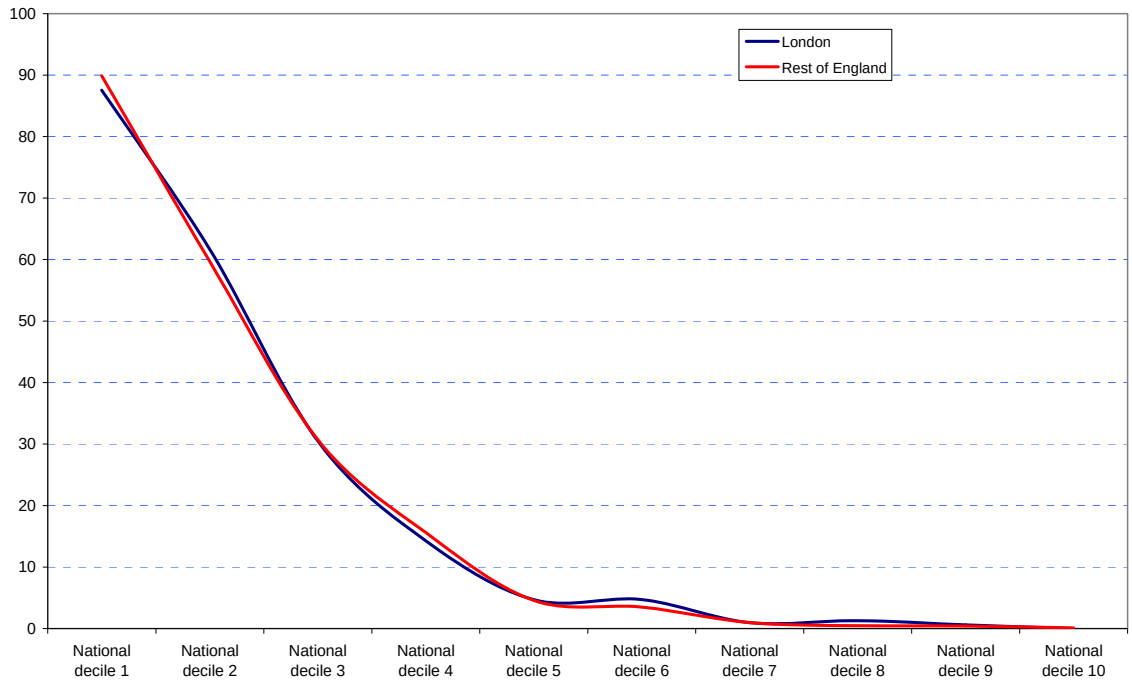
Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

It is important to realise that the household analysis is fundamentally different from simply the numbers of older people actually living in fuel poverty. When fuel poverty rates amongst all age cohorts are examined, the highest rate in London is actually amongst the 16 to 24 age cohort. Nationally, the fuel poverty rate amongst the 16-24 cohort and the 75 and over cohort is broadly similar.

4. National basic income decile analysis[15]

As expected, rates of fuel poverty are highest in households in the lowest national basic income decile and reduce with every incremental decile. 86.1 per cent of London households in the lowest national decile are in fuel poverty (up from 78.9 per cent in 2008). This is perhaps not surprising as the cut off point for this decile is just over £9,000 basic income per annum. 58.4 per cent of London households in the second decile are also in fuel poverty. This represents a considerable increase on 2008 when the proportion was only 42.4 per cent. The upper cut off for this decile is just over £11,900 basic income per annum (in 2009). 70.6 per cent of all London households in fuel poverty are in these two deciles although this is actually the lowest proportion of any region. The decile curves for London and the rest of England are shown in Figure 9.

Figure 9: Proportion of households in fuel poverty by national basic income decile (Percentage, 2009)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations[16]

[15] Note that national deciles for England have been used rather than deciles for each and every individual region. This is in line with ONS recommendations.
[16] Additional data relating to this graph can be found in Appendix 2.

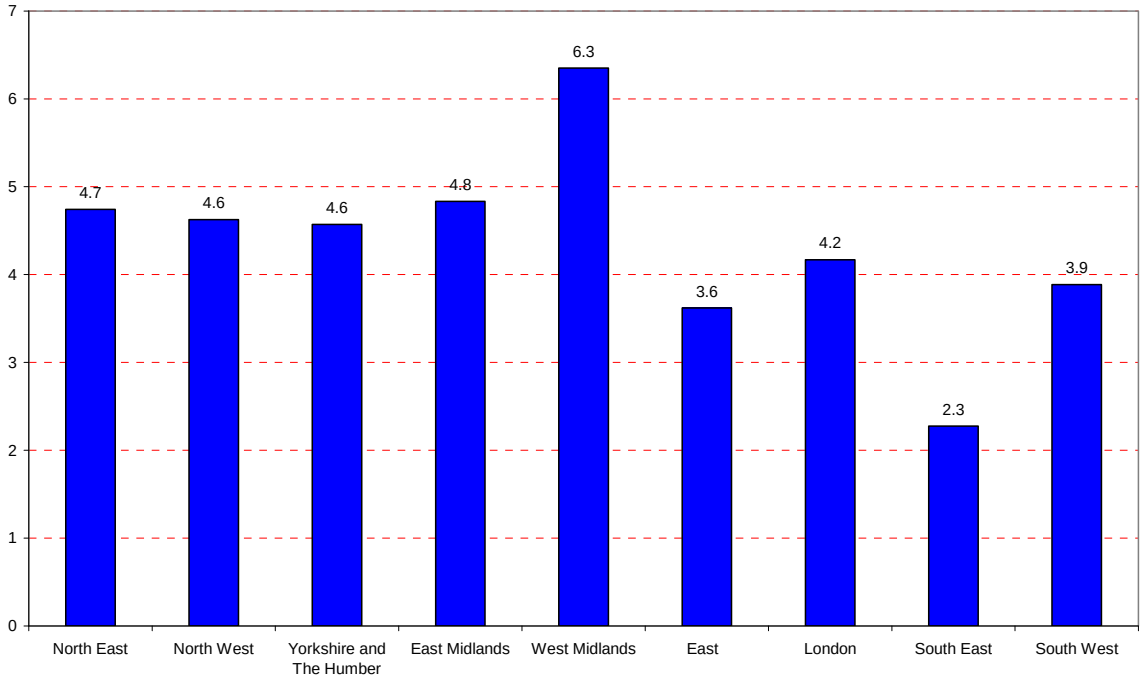
5. 'Severe' fuel poverty

To date, only a limited amount of work seems to have been done on ***severe*** fuel poverty. For the purposes of this document, this will be defined as all households who would spend 20 or more per cent of their basic income to keep adequately warm (using the official DECC definition in terms of adequate room temperatures). Nationally, 4.2 per cent of households in 2009 required 20 per cent or more of their basic income to keep warm (up from 3.3 per cent in 2008.)

For the 20 per cent of basic income threshold the capital ranks 6th (the same ranking as for the overall incidence of fuel poverty[17]) with a rate of 4.2 per cent as shown in Figure 10 – the same as for England as a whole.

Severe fuel poverty has risen in every region – proportionately far more in some regions than in London where it has increased to 4.2 per cent from 3.8 per cent in 2008. The West Midlands has the highest proportion in both years: 6.3 per cent in 2009 (up from 4.8 per cent in 2008).

Figure 10: Proportion of households in severe fuel poverty by region (Percentage of all households in region, 2009)

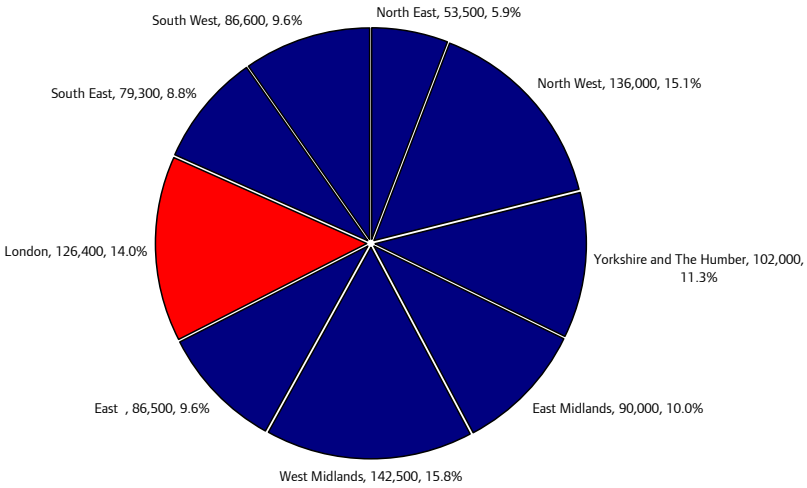


Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

126,400 London households fall within this 'severe fuel poverty' category, equating to around 14 per cent of all households in England in severe fuel poverty – the highest share of any region other than the North West and the West Midlands as shown in Figure 11. In 2008, London had the single highest proportion of any region.

[17] On this ranking the highest incidence of severe fuel poverty is ranked 1.

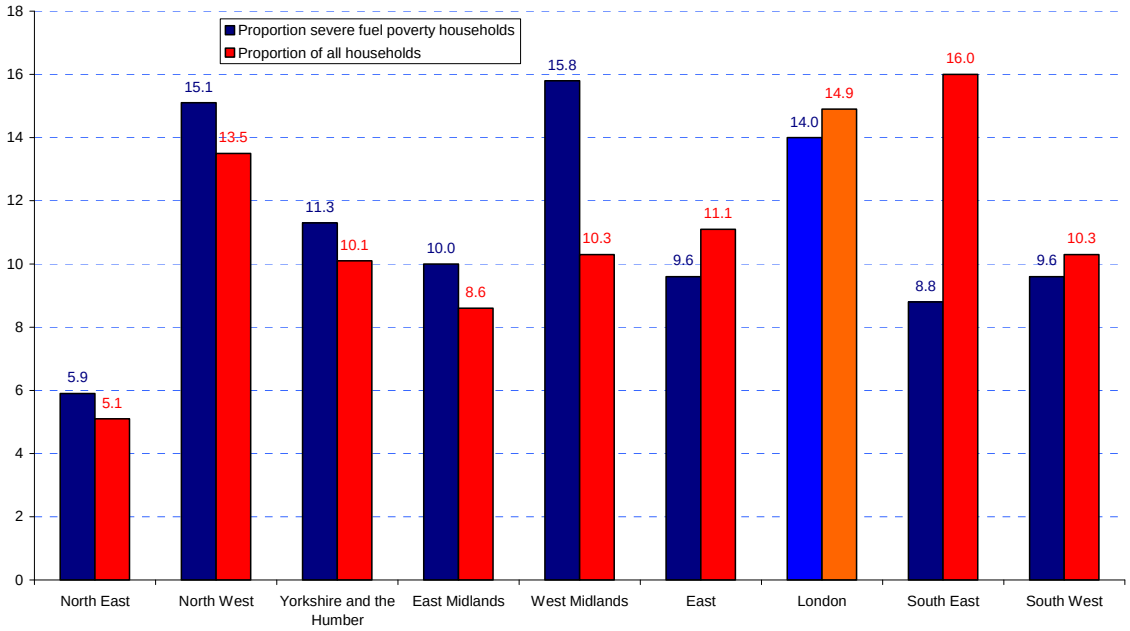
Figure 11: Number of households in severe fuel poverty (on basic income definition) by region and share of households in severe fuel poverty across England (2009)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

This means that of all London households in fuel poverty 22.5 per cent are also in severe fuel poverty – a slightly smaller proportion than in 2008. Figure 12 shows that London is still slightly 'under-represented' compared to its national share of total households.

Figure 12: Percentage share of households in England by region according to Communities & Local Government (CLG) compared to the share of households in severe fuel poverty on the basic income measure (2009)

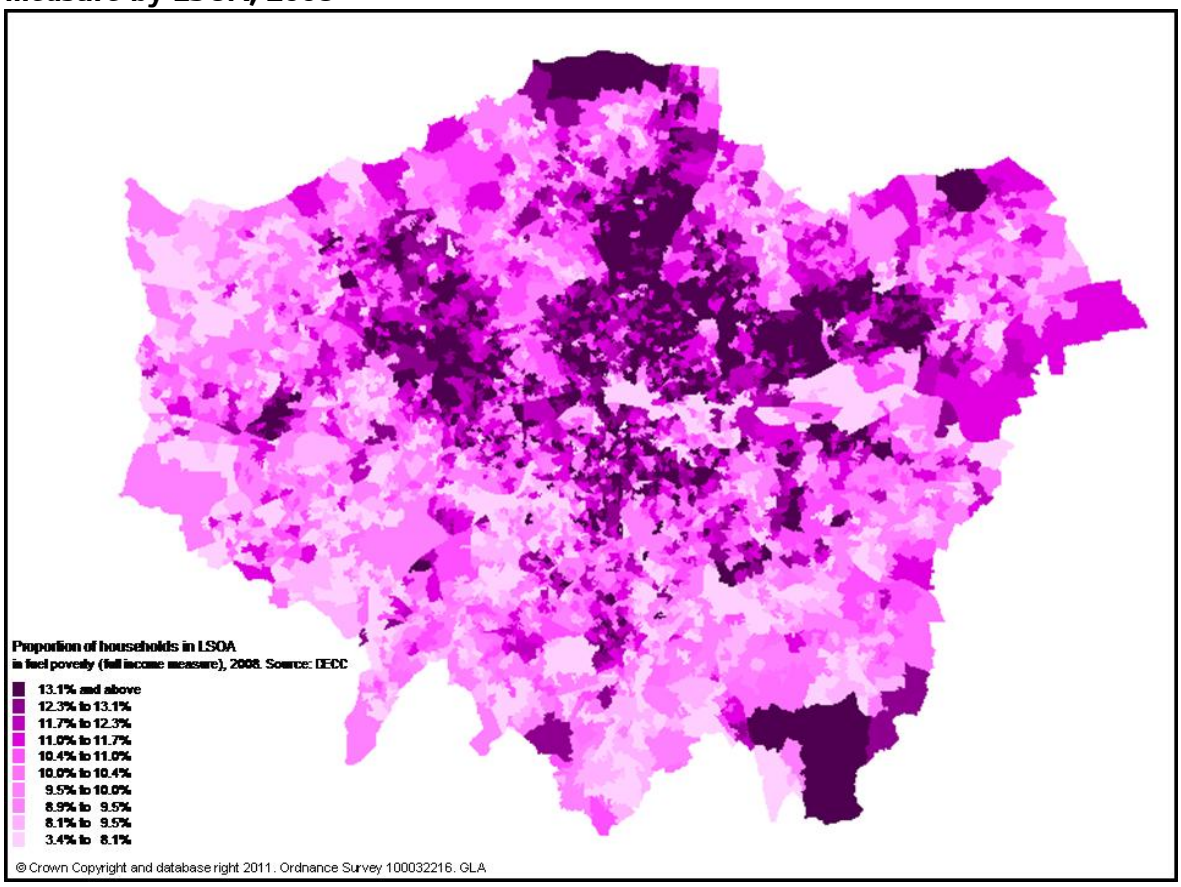


Source: Communities and Local Government (CLG), DECC Fuel Poverty Dataset, GLA Economics calculations

6. The spatial distribution of fuel poverty in the capital

In order to produce a map at the lower super output area (LSOA) level, it has been necessary to work with the full income measure from 2008. Whilst using 2009 data and the basic income measure would change the proportion of households in fuel poverty in each LSOA it is unlikely to change the spatial distribution of fuel poverty across London. As a result, the 2008 full income figures are likely to give a good illustration of the spatial distribution of fuel poverty in London. The raw data for these maps can be accessed via DECC's website[18]. This mapping work suggests that the highest rates of fuel poverty in the capital are to be found in Newham and Hackney. The lower super output area analysis suggests that there is a concentration of LSOAs with particular fuel poverty issues to the north of the Thames in Inner East London and up through the Lea Valley. This is broadly the 'horseshoe' shaped area associated with almost all indicators of poverty, low income and deprivation. However, the analysis also shows that there are pockets of high levels of fuel poverty in every Borough with the exception of the City. In terms of proportions of total household numbers in each Borough, all parts of Outer South London have *relatively* few households in fuel poverty. However, a Borough such as Croydon has large *actual* numbers simply on account of the overall number of households in the Borough. Map 1 shows areas with a higher incidence of fuel poverty in darker shades.

Map 1: Estimated proportion of households in fuel poverty on the full income measure by LSOA, 2008

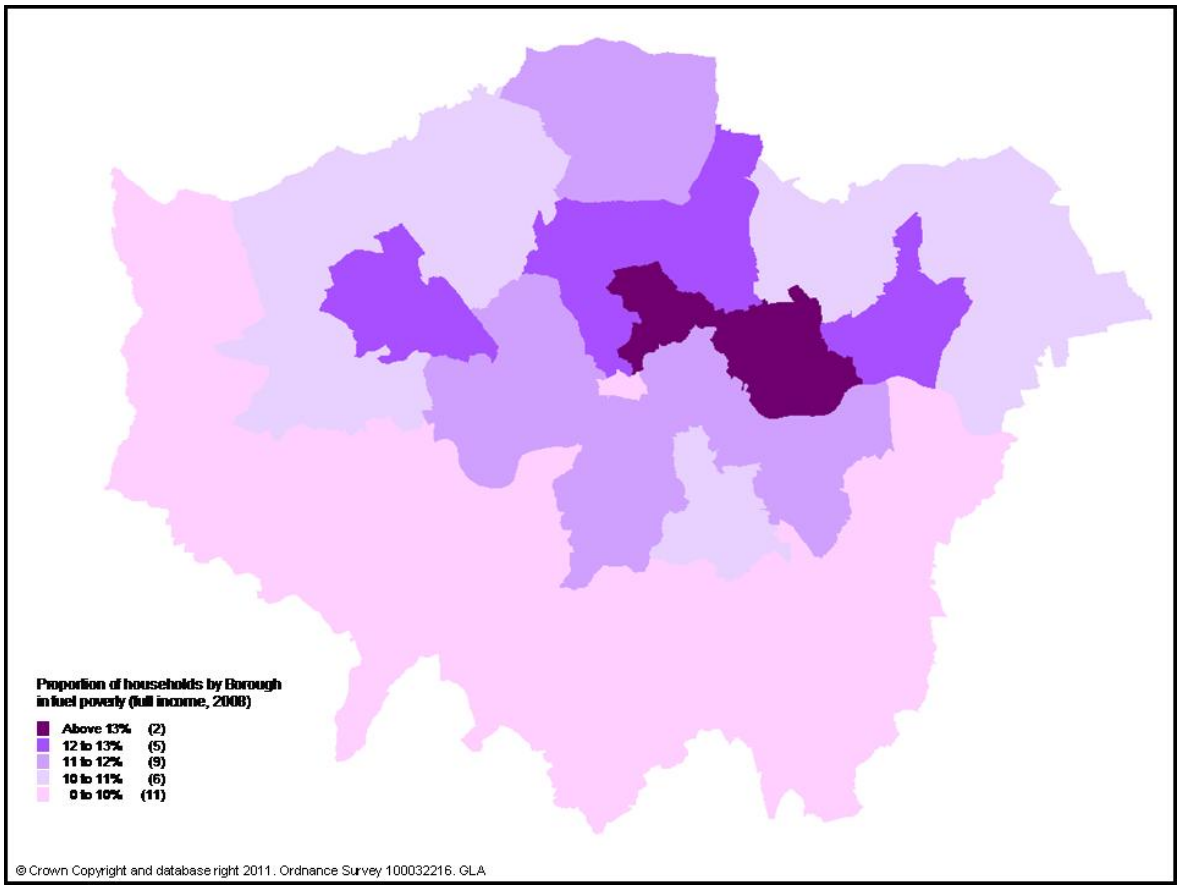


Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

[18] http://www.decc.gov.uk/assets/decc/Statistics/fuelpoverty/1297-subregional-fuel-poverty-data-2008.xls

Map 2 shows the same basic data presented at the Borough level. Darker areas again indicate higher proportions of households in fuel poverty. However, note that the differences between the ranges are less than might be implied visually. For example, a Borough with a proportion of 9.9 per cent of households in fuel poverty would be in the lowest range whilst one with a proportion of 13.1 per cent would be in the highest.

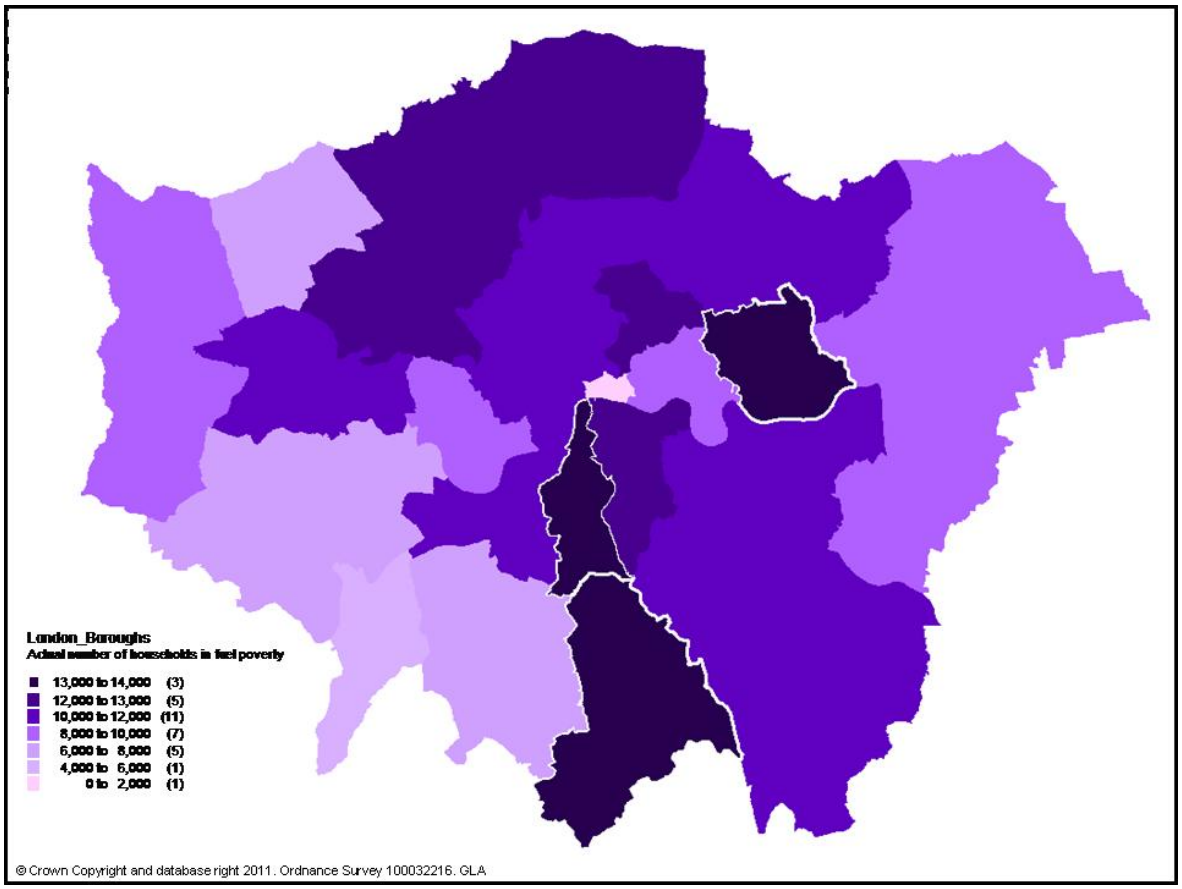
Map 2: Estimated proportion of households in fuel poverty on the full income measure by Borough, 2008



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

Map 3 shows a very different pattern generated when looking at actual numbers of households in fuel poverty in each Borough.

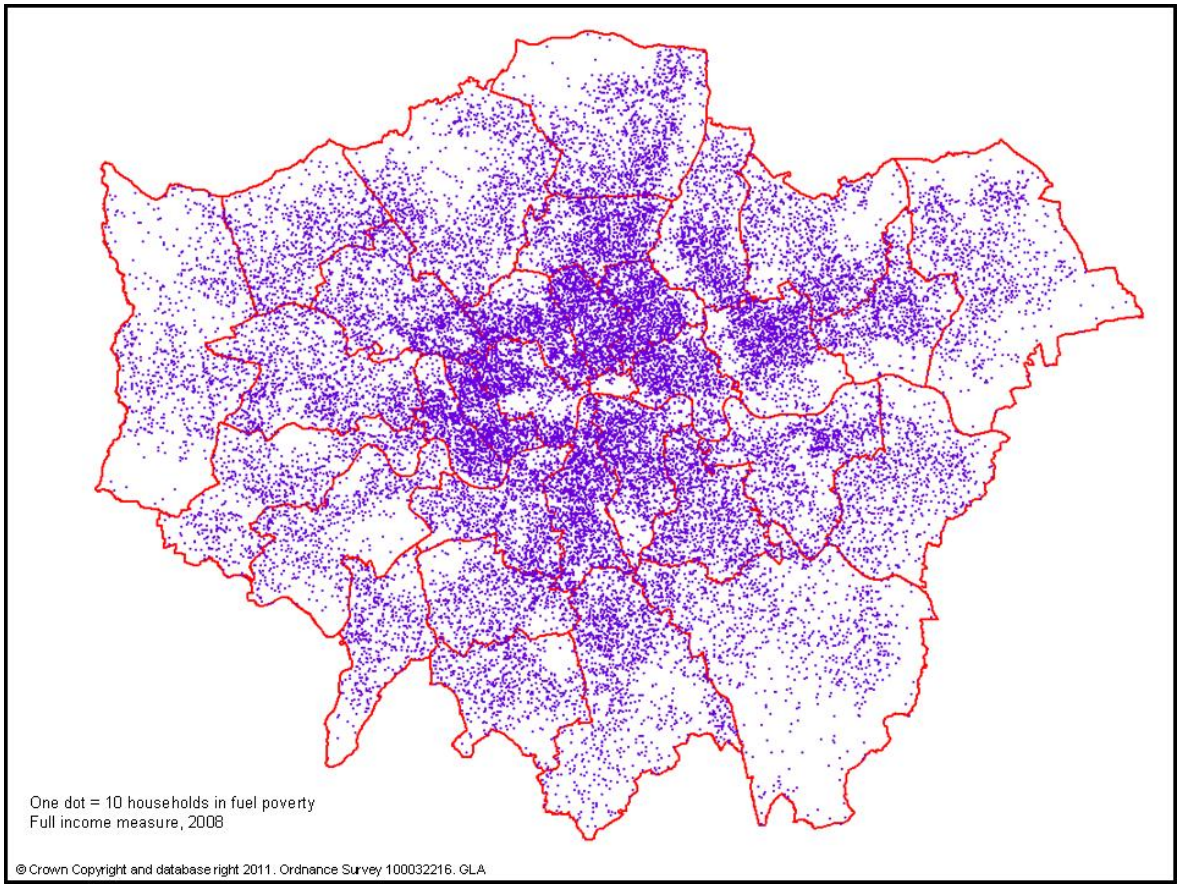
Map 3: Actual number of households in fuel poverty on the full income measure by Borough, 2008



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

Map 4 shows the actual distribution of households in fuel poverty (based on LSOA boundaries) where 1 dot is equivalent to ten households in fuel poverty. As with all the maps the data behind it is for 2008 and on the basis of the full income measure.

Map 4: LSOA location of actual households in fuel poverty on the full income measure by Borough, 2008 (each dot = 10 households in fuel poverty)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

7. Scenario building

Fuel poverty estimates scenarios methodology

A number of separate drivers will affect levels of fuel poverty in London. These include changing household composition, the rollout of programmes such as RE:NEW and social tariffs.

However, for simplicity, a basic model has been constructed for which the only inputs are:

- A fuel prices index in constant prices relative to Consumer Price Index (CPI);
- A forecast of basic income proxied to either GLA Economics' forecasts of household disposable income (HDI) or the equivalent forecasts of Experian Economics (depending on scenario);
- Household numbers from GLA Intelligence.

In this section, four different scenarios have been modelled to try to understand a possible range of outcomes for fuel poverty over the next few years. Factors which are not included in the modelling are discussed in Appendix 1 at the end of this document.

Scenario 1: 'GLA Economics income growth, known fuel price rises'

For this scenario, the following assumptions have been made:

- A 15 per cent increase in energy bills starting at the beginning of the last quarter of 2011 but having its main impact in 2012[19];
- No further fuel price rises in the first part of 2012 but with prices in the second half of 2012 and the first half of 2013 rising by the forecast rate of CPI inflation (as forecast by the average of independent forecasters quoted by the Treasury);
- Income growth proxied to household disposable income growth within GLA Economics' model for 'London's Economic Outlook'[20].

The above assumptions regarding fuel prices create a scenario which applies a factor to every household in the London sample of the English Housing Survey 2009. Similarly, the disposable income forecasts are indexed and applied to the 2009 basic income for each year. Of course, the implicit assumption here is that household incomes rise 'across the board' which may well not be the case. In recent years incomes for different types of household and different sources of income have risen at very different rates.

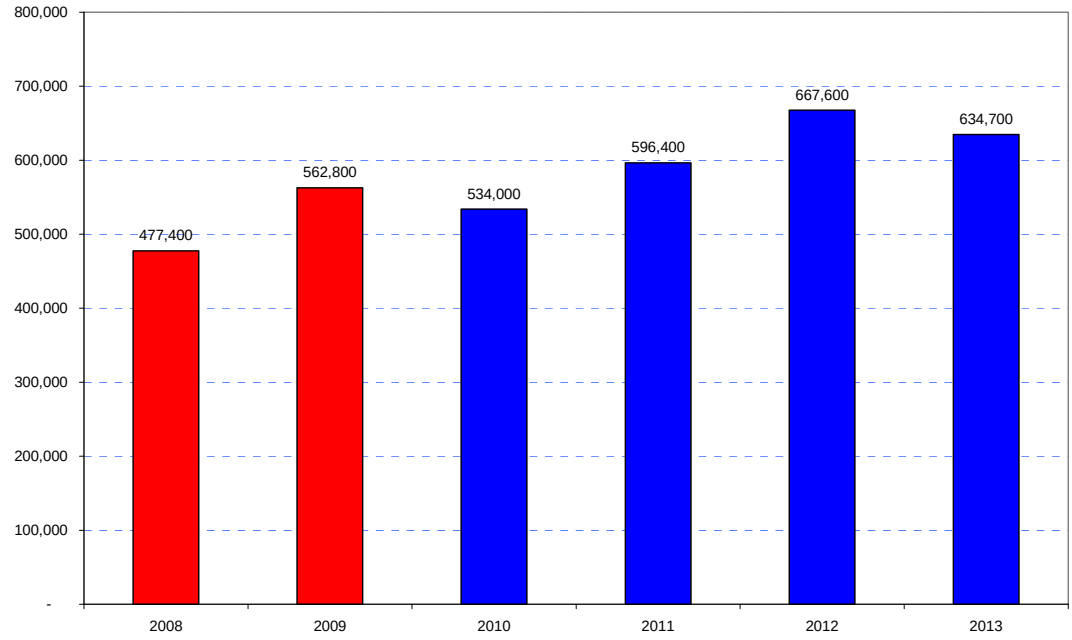
[19] The 15 per cent is calculated upon the basis of announced electricity and gas bill increases apportioned to the broad supply shares for London.
[20] For London's Economic Outlook see http://www.london.gov.uk/gla-economics-publications#economy_forecasts

In effect, the calculation of whether a particular household is in fuel poverty or not can then be reduced to:

Fuel need ratio = (2009 fuel expenditure need * factor for fuel price growth) / (2009 basic income * HDI factor for income growth)

Where the result of this calculation is greater or equal to 0.1, the household is deemed to be in fuel poverty for that year. Households for which the result is between 0.0 and 0.1 are deemed not to be in fuel poverty because they need to allocate 10 per cent or less of their basic income to fuel to keep adequately warm. The total number of households in fuel poverty is then weighted by the rise in projected household numbers (which assumes that there is no difference in the likelihood for being in fuel poverty in the new formation element relative to the overall stock of households – which, again, may be untrue as newbuild tends to be more energy efficient).

Figure 13: Numbers of London households modelled in Scenario 1 to be in fuel poverty

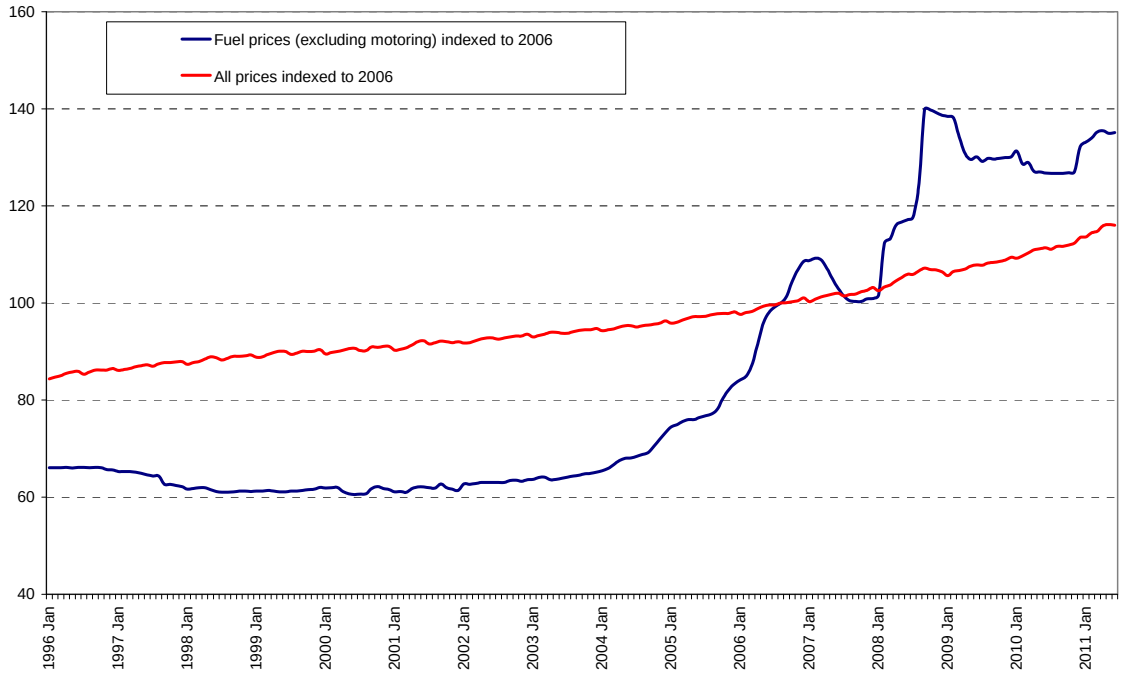


Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey / GLA Economics / GLA Intelligence Unit

The data show that 2010 is 'backcast' to be a marginally better year for fuel poverty in London, driven by lower fuel prices over the year. This is evident from Figure 14 in which indexed fuel prices are lower in 2010 than they were in 2009 in spite of the rise in overall prices throughout the economy. It is important to note that for 2010, fuel prices are known data. However, after the increase in fuel prices in the final quarter of 2011, numbers of households in fuel poverty begin to rise relatively steeply with the maximum impact being felt in 2012 as shown in Figure 13.

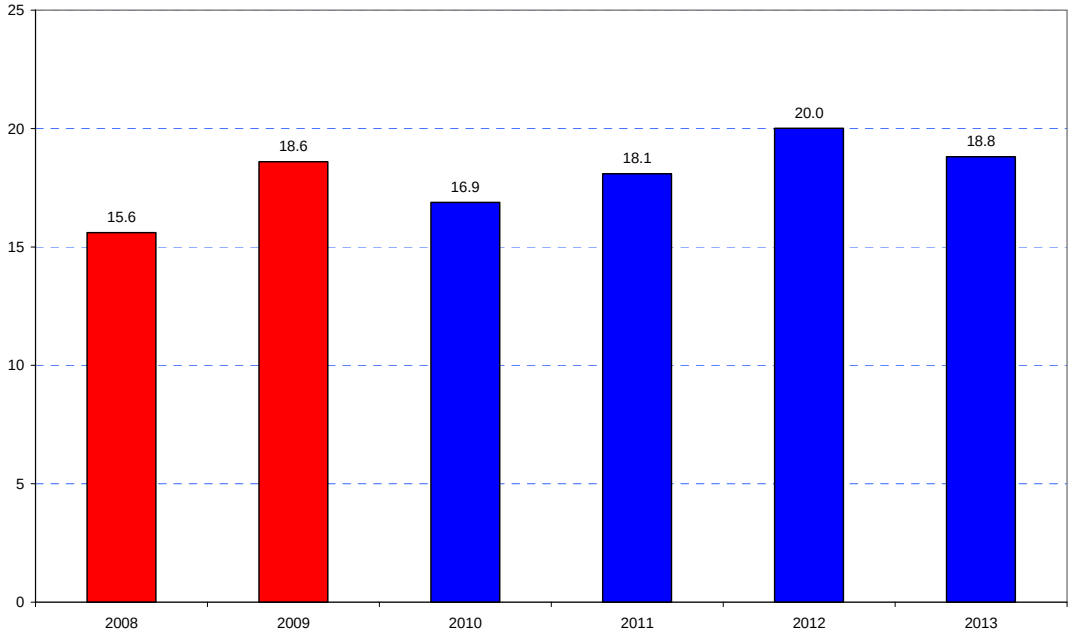
As a percentage the 2012 number represents 20 per cent of all the capital's households but, under the stated assumptions of Scenario 1, this would be projected to decline in 2013 as shown in Figure 15.

Figure 14: Fuel prices and all prices within the economy indexed to summer 2006



Source: ONS – CPI inflation and components series

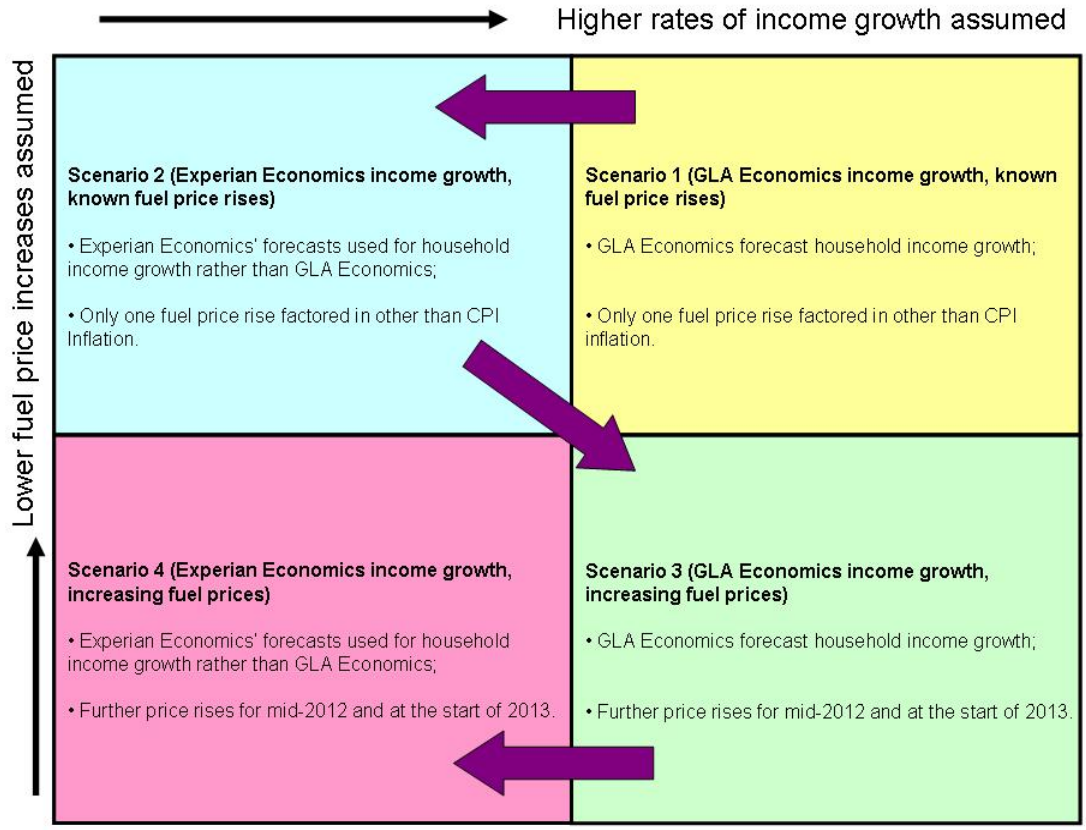
Figure 15: Percentages of London households modelled in Scenario 1 to be in fuel poverty



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey / GLA Economics / GLA Intelligence Unit

The remaining three scenarios have been created as variants of this initial scenario. They model the possibilities of higher fuel price rises and lower rates of income growth. Therefore in Figure 16 the 'GLA Economics income growth, known fuel price rises' scenario above appears in the most 'optimistic' corner of the scenario matrix with the highest assumed rates of household income growth and the lowest fuel price increases assumed. Scenarios 2 and 3 present alternative assumptions on the income and fuel price sides respectively, whilst Scenario 4 presents the combination of both the lower income growth exhibited by the Experian Economics forecast for incomes and increasing fuel prices – which will, of course, have the greatest impact on raising the numbers of households in fuel poverty.

Figure 16: Schematic matrix of 4 fuel poverty modelling scenarios with assumptions



Source: GLA Economics

Scenario 2: 'Experian Economics income growth, known fuel price rises'

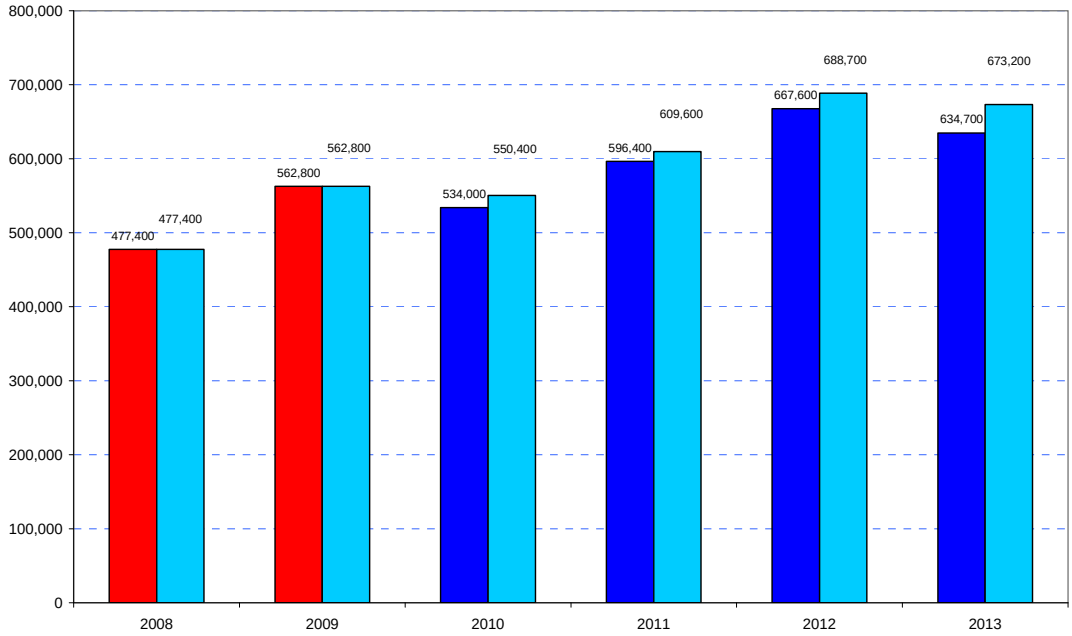
In the three remaining scenarios, assumptions can be imputed to be the same as in Scenario 1 apart from stated assumption variants.

Assumption variants from baseline:

- No change in the fuel price assumptions which remain as with Scenario 1;
- GLA Economics' household disposable income forecasts are replaced by those from Experian Economics' Regional Planning Service – which have a slower recovery in household incomes than GLA Economics. These are applied to the basic income series.

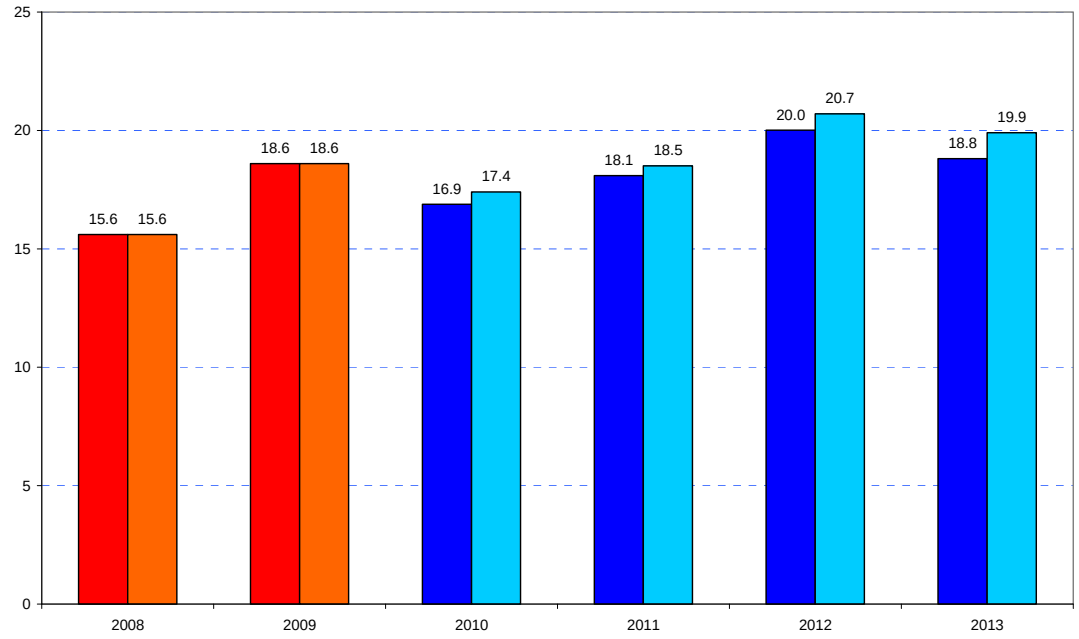
For 2010 and 2011 the effect of these changes in assumptions is relatively minor. For 2010 there would be 550,400 forecast households in fuel poverty or 17.4 per cent (compared to 16.9 per cent in Scenario 1). For 2011, the gap is actually slightly narrower with 609,600 households in fuel poverty or 18.5 per cent (compared to 18.1 per cent in Scenario 1). Divergence between the two scenarios is not even that great in 2012 with 688,700 households in the capital in fuel poverty or 20.7 per cent (compared to 20.0 per cent in Scenario 1). Only in 2013 do the two variants really start to diverge on account of the different forecasts for household disposable income. For that year under Scenario 2, 673,200 households in London would be in fuel poverty as shown in Figure 17. That represents 19.9 per cent of households compared to 18.8 per cent in Scenario 1, as demonstrated in Figure 18.

Figure 17: Actual numbers of London households modelled in Scenario 2 to be in fuel poverty (second column for each year) compared to Scenario 1 (first column)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey / Experian Economics RPS / GLA Economics / GLA Intelligence Unit

Figure 18: Percentages of London households modelled in Scenario 2 to be in fuel poverty (second column for each year) compared to Scenario 1 (first column)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey / Experian Economics RPS / GLA Economics / GLA Intelligence Unit

It should be kept in mind that, although the income forecasts for 2013 are rather different, both Scenario 1 and Scenario 2 represent what might be considered 'central' forecasts and more extreme scenarios for basic income could be developed.

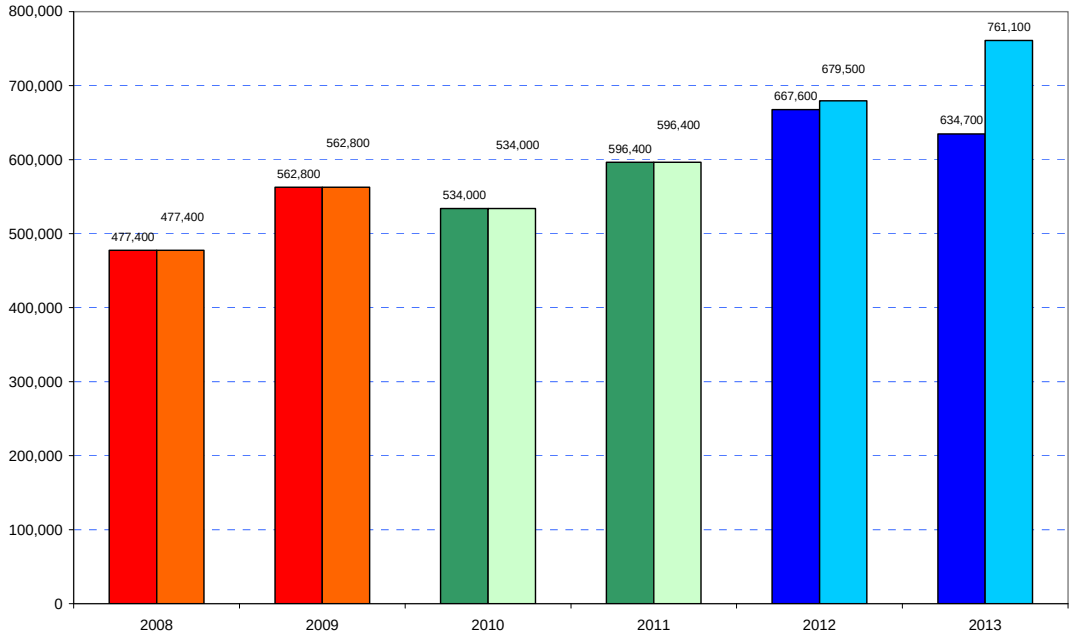
Scenario 3: 'GLA Economics income growth, increasing fuel prices'

Assumption variants from Scenario 1:

- The same 15 per cent increase in energy bills starts at the beginning of the last quarter of 2011 as in Scenario 1 but then there is a further increase of 5 per cent in mid-2012, and at the beginning of 2013 fuel prices increases in line with their average annual increase over the period from the winter of 2006/07 through to that of 2009/10 (which is historically high but still lower than the increases seen between 2005 and 2006).
- On the basic income side, GLA Economics' forecasts for HDI are applied as factors rather than those of Experian Economics.

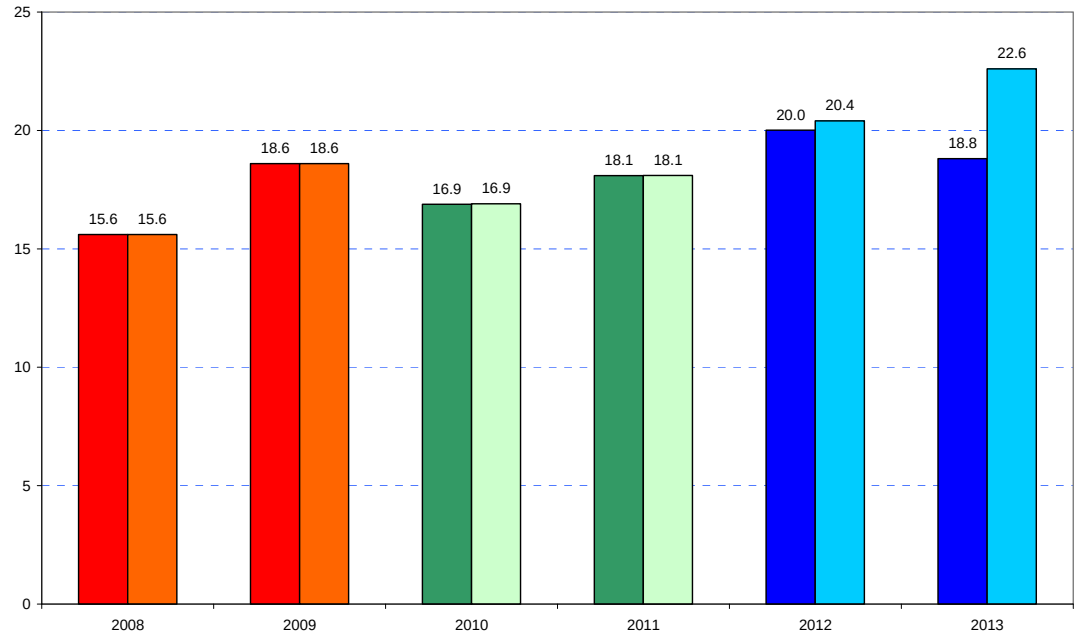
In this scenario there is no change from baseline for 2010 and 2011 because the change in scenario does not take place until the middle of 2012. The effect on 2012 itself is relatively weak with 679,500 households in the capital estimated to be in fuel poverty (or 20.4 per cent as opposed to 20.0 per cent in Scenario 1.) On account of the more dramatic change of assumptions for fuel price increases from the beginning of 2013 (which involves more than a 11 per cent nominal hike in prices), the effect on the scenario for fuel poverty is more serious: 761,100 households in the capital or 22.6 per cent (compared to 18.8 per cent in Scenario 1) as shown in Figures 19 and 20.

Figure 19: Actual numbers of London households modelled in Scenario 3 to be in fuel poverty (second column for each year) compared to Scenario 1 (first column)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey / ONS - CPI / GLA Economics / GLA Intelligence Unit

Figure 20: Percentages of London households modelled in Scenario 3 to be in fuel poverty (second column for each year) compared to Scenario 1 (first column)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey / ONS - CPI / GLA Economics / GLA Intelligence Unit

Of course, it is also possible that towards the end of the period fuel prices could fall (in either real or nominal terms). This has currently not been modelled.

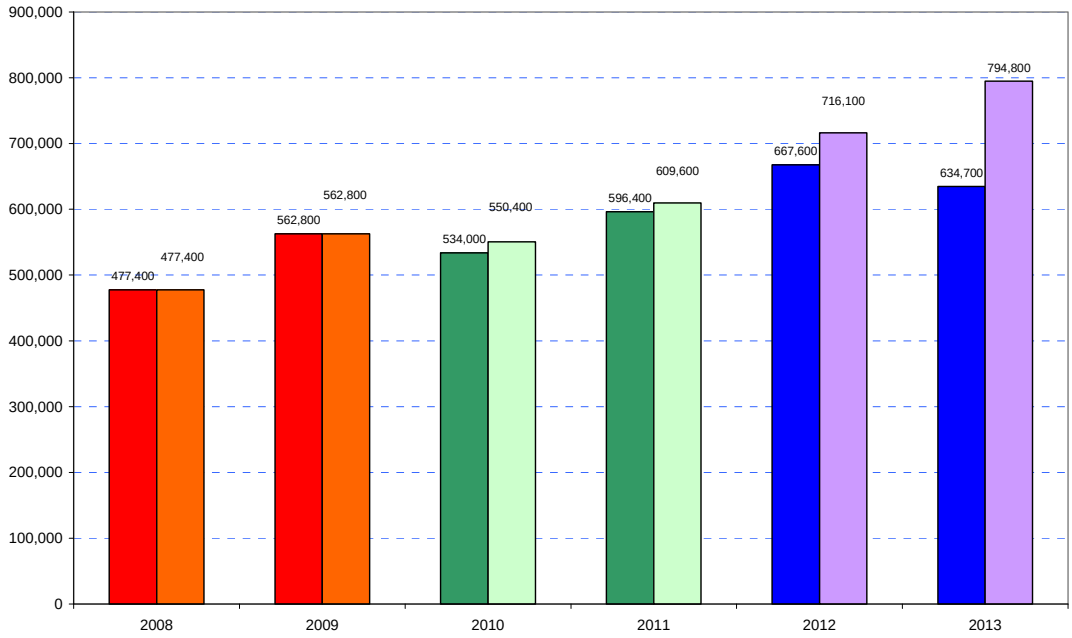
Scenario 4: 'Experian Economics income growth, increasing fuel prices'

Assumption variants from Scenario 1:

- The same 15 per cent increase in energy bills starts at the beginning of the last quarter of 2011 as in the baseline model but then there is a further increase of 5 per cent in the middle of 2012, and at the beginning of 2013 fuel prices increase in line with their average annual increase over the period from the winter of 2006/07 through to that of 2009/10;
- On the basic income side, Experian Economics' HDI forecasts are used rather than those of GLA Economics.

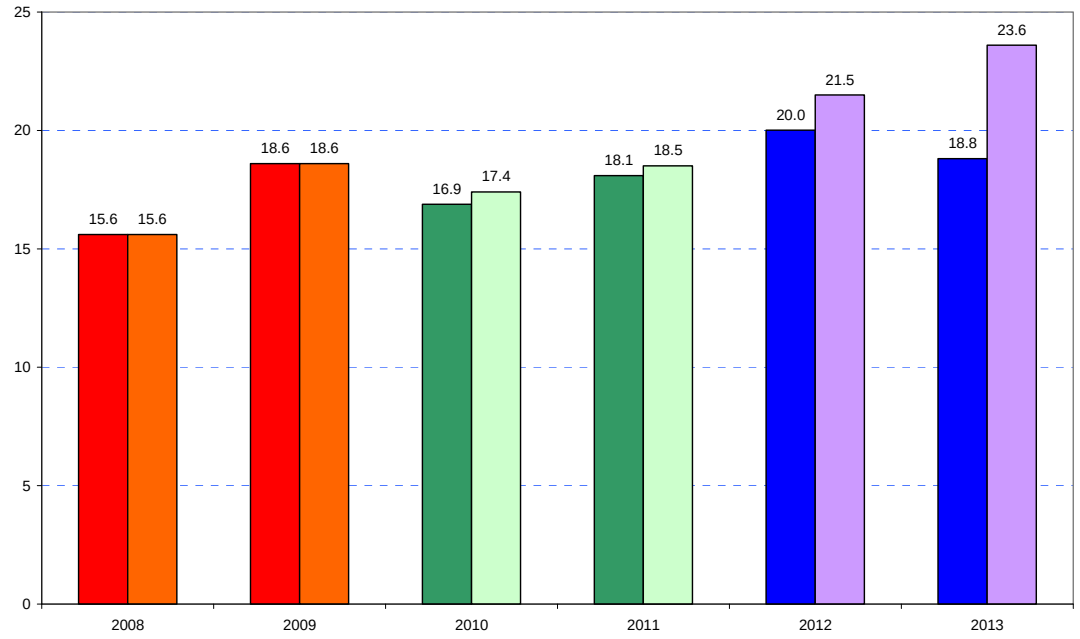
In this scenario the results for 2010 and 2011 follow Scenario 2 raising the total number of households in fuel poverty in the capital to 609,600 in 2011. After that the additional fuel increases combine with lower than anticipated growth in incomes to raise the number of households in fuel poverty to 716,100 in 2012 and 794,800 in 2013 – some 25 per cent above the Scenario 1 projection as shown in Figure 21. That equates to 23.6 per cent of all London households compared to 18.8 per cent in Scenario 1. Scenario 4 also results in the highest fuel poverty incidence for 2012 (21.5 per cent) of any of the four modelled scenarios as shown in Figure 22.

Figure 21: Actual numbers of London households modelled in Scenario 4 to be in fuel poverty (second column for each year) compared to Scenario 1 (first column)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey / ONS - CPI / GLA Economics / GLA Intelligence Unit / Experian Economics

Figure 22: Percentages of London households modelled in Scenario 4 to be in fuel poverty (second column for each year) compared to Scenario 1 (first column)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey / ONS - CPI / GLA Economics / GLA Intelligence Unit / Experian Economics

Tables 2A and 2B summarise the results of the scenario modelling in terms of percentages of all households and total numbers of households respectively. Depending on the various assumptions around income and fuel prices, fuel poverty incidence in the capital varies between 16 per cent and 24 per cent over the period.

Table 2A: Summary of results (Percentages of total households in fuel poverty in London by year)

Scenario	2010	2011	2012	2013
1	16.9	18.1	20.0	18.8
2	17.4	18.5	20.7	19.9
3	16.9	18.1	20.4	22.6
4	17.4	18.5	21.5	23.6

Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey / ONS - CPI / GLA Economics / GLA Intelligence Unit / Experian Economics

Table 2B: Summary of results (Numbers of households in fuel poverty in London by year)

Scenario	2010	2011	2012	2013
1	534,000	596,400	667,600	634,700
2	550,400	609,600	668,700	673,200
3	534,000	596,400	679,500	761,100
4	560,400	609,600	716,100	794,800

Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey / ONS - CPI / GLA Economics / GLA Intelligence Unit / Experian Economics

Those factors likely to influence results which have not been modelled are discussed in Appendix 1.

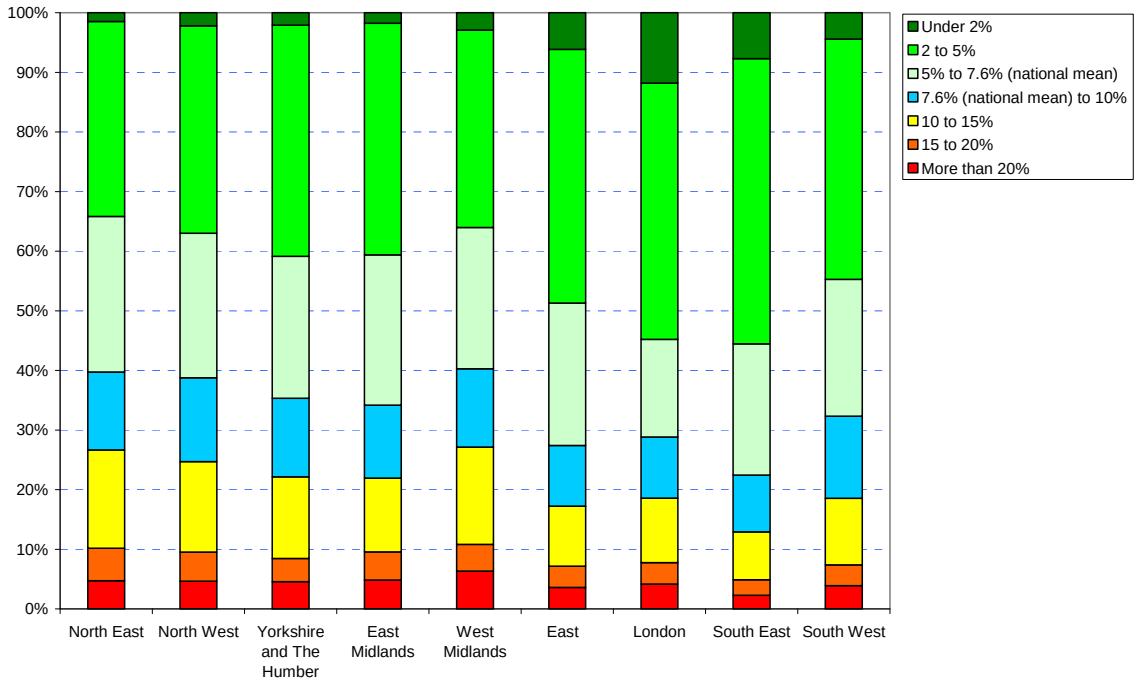
Some basic sensitivity analysis examining the impact of 10 per cent increases and decreases in basic incomes and fuel costs suggest that the impact of changes in incomes are of a similar scale to the impact of changes in prices. However, the comparison is not entirely valid because fuel price volatility makes 10 per cent changes in fuel prices more likely than 10 per cent changes in basic incomes.

8. What proportions of households are just below the thresholds for fuel poverty and severe fuel poverty?

London and the South East region have much higher proportions of households requiring less than 5 per cent of their basic income in fuel bills than the rest of England. However some 310,800 households in the capital require more than the national average of 7.6 per cent of basic income to cover their fuel needs, but less than the critical threshold for fuel poverty of 10 per cent. Figure 23 shows this group as blue. If future changes in income, fuel costs and other things were to bring them into fuel poverty then they would increase the overall number of households in fuel poverty in London by the order of 55 per cent.

Furthermore, the orange group (those households requiring 15-20 per cent of their basic income to cover their fuel needs) in Figure 23 represents households who are already in fuel poverty and are at risk of falling into severe fuel poverty. There are 108,500 households in this group in the capital. If they were to fall into severe fuel poverty, they would increase the number of households in severe fuel poverty in the capital by in excess of 85 per cent.

Figure 23: Share of regional households by banded proportion of basic income required for fuel (2009)



Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations[21]

[21] Additional data relating to this graph can be found in Appendix 2.

Conclusion

London is a long way from eradicating fuel poverty. The existing DECC methodology for calculating fuel poverty using full income underestimates the incidence of fuel poverty in the capital due to the inclusion of housing-related benefits as income under that definition. All English regions are actually affected but the capital more than any other. Using a basic income measure in its place raises the incidence of fuel poverty in London from 13.3 per cent to 18.6 per cent. Furthermore, the actual numbers of households involved are very substantial (although the 12.9 per cent share of national households in fuel poverty is slightly less than London's share of English households).

When severe fuel poverty is examined, there are more than 126,400 households in London falling within that definition. However, in the case of both fuel poverty and severe fuel poverty, there are significant numbers in the capital just beneath the threshold level. The fact that both earnings and benefits are under pressure in the current austere economic climate at a time when there are clear signals from the utility companies that large fuel bill increases lie ahead risks bringing these households into fuel poverty.

However, some simple scenario building actually indicates a relatively flat profile for fuel poverty in the capital between 2009 and 2011. The current round of fuel price increases will not have their greatest impact until 2012. Those data will be available from DECC in the summer of 2014. Modelled scenario results for 2013 suggest fuel poverty incidence on the basic income measure of somewhere between 19 and 24 per cent.

Appendix 1: Unmodelled influences

The impact of most of the other potential inputs to the model (i.e. the rollout of energy efficiency measures, social tariffs and greater fuel efficiency of newbuild) – which were not modelled in this analysis - are likely to drive fuel poverty lower. However, the effects of a changing household mix are less certain. Single households tend to be smaller, more likely to be flats and more energy efficient but the energy requirement of heating two properties is usually greater than heating one. Changing household composition could be a key factor in London where nearly all the new formation is single person or lone parent households. A small (but potentially significant) impact will come from regional variations in fuel prices. Furthermore, over the coming years, there is likely to be upward pressure on prices exerted by the costs associated with 'greener' energy and new nuclear power stations.

The exact net effect of all these unmodelled influences is extremely difficult to predict. However, there are some indicative findings which may eventually prove of use in more complex modelling for the capital from DECC's national work. For example, it is clear that social tariffs are most likely to reduce fuel poverty amongst older person households and, therefore, potentially, less in London than in some other regions of England. The national model indicates that the income deciles actually most likely to be affected by social tariffs are deciles 2 and 3 because decile 1 tends to require too great a 'push' to be removed from fuel poverty by the tariffs.

In contrast, the relationship with household size proves to be very non-linear although households consisting solely of one member are in the order of 50 per cent more likely to be in fuel poverty than multiple person households. Furthermore, according to a study by the IFS[22], poor people in the UK are suffering from a significantly higher rate of inflation than the relatively well-off. This gap in inflation rates between different socioeconomic categories has widened since the 2008/09 recession. Over the 2008 to 2010 period, households in the poorest quintile of incomes experienced Retail Price (RPI) inflation of 4.3 per cent compared to 2.7 per cent for the highest income quintile. One of the drivers for this is that lower income households have to devote a higher share of their spending to fuel payments than higher income households. In particular, pensioners (especially single pensioners) and those dependent on state benefits are hit especially hard by increases in fuel prices. This is in spite of the observed characteristic that lower income households reduce their fuel consumption by a greater proportion than those with higher incomes[23].

Furthermore, the implicit assumption of the equal distribution of basic income percentage increases is very likely to be a false assumption. Apart from the historical trend for incomes to increase in certain sections of society more rapidly than in others, proposed changes to the structure of benefits towards a 'universal' credit system, caps upon some benefits and more stringent tests to qualify for them are likely to exert a very significant influence on many of

[22] See Peter Levell & Zoe Oldfield – *The spending patterns and inflation experience of low-income households over the past decade.* (Institute for Fiscal Studies: IFS Commentary C119, June 2011). Note that other studies (including some published by the IFS) have shown less difference in the relative inflation rates between different socioeconomic groups.
[23] Ibid. Amongst the lowest income quintile a 10 per cent increase in domestic energy bills was associated with a 6 per cent reduction in fuel consumption.

the groups in question on the fuel poverty front. However, the impact may not always be to increase numbers in fuel poverty in the capital.

Note that neither the London model nor the national model operated by DECC takes any account of variation in annual patterns of weather. It stands to reason that in a particularly cold winter more people will be pushed into fuel poverty because their heating requirement will be higher than that estimated by surveyors for the English Housing Survey.

Appendix 2: Additional tables

The following tables relate to earlier charts in the main document

Table 3: Proportion of households in each energy performance band in fuel poverty on the basic income measure – London and the rest of England (%, 2009) (See related Figure 5 chart)

Energy performance band	London - % in FP	Rest of England - % in FP
B	3.8	18.4
C	13.0	12.2
D	17.0	15.3
E	18.2	20.4
F	30.8	35.4
G	59.4	62.3
All	18.6	20.6

Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

Table 4: Numbers of all households in London and in the rest of England in each energy performance band and numbers of all households in fuel poverty by energy performance band – basic income definition (2009) (See related Figure 6 chart)

Energy performance band	London – all households	London – households in FP	Rest of England – all households	Rest of England – households in FP
B	35,000	1,300	93,600	17,200
C	517,600	67,300	2,323,000	282,800
D	1,067,100	181,700	7,066,500	1,083,400
E	1,095,400	199,100	6,235,200	1,274,800
F	259,300	79,800	2,156,400	763,400
G	56,500	33,500	629,800	392,400

Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

Table 5: Vulnerable households in fuel poverty:
(iii) Vulnerable households in fuel poverty as a percentage of all households in fuel poverty by region;
(iv) Percentage of vulnerable households in fuel poverty by region (2009).
(See related Figure 7 chart)

	North East	North West	Yorkshire and the Humber	East Midlands	West Midlands	East	London	South East	South West
Percentage of vulnerable households in fuel poverty	29.7	27.7	24.9	25.1	30.2	19.7	23.5	14.7	22.0
Vulnerable households in fuel poverty as a percentage of all households in fuel poverty	82.5	83.2	78.3	84.7	80.4	83.8	82.5	81.6	85.9

Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

Table 6: London and national shares of fuel poverty by eldest member of household (Percentage of all fuel poor households, 2009) (See related Figure 8 chart)

Age of eldest household member	London - % in FP	Rest of England - % in FP
16-24	9.5	5.6
25-34	12.5	9.2
35-49	28.6	21.1
50-59	15.1	15.8
60-74	22.6	26.1
75 or above	11.7	22.2

Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

Table 7: Proportion of households in fuel poverty by national basic income decile (Percentage, 2009) (See related Figure 9 chart)

National decile	London - % in FP	Rest of England - % in FP
1	87.5	89.9
2	61.6	59.7
3	30.5	30.7
4	14.3	15.6
5	4.7	4.6
6	4.7	3.5
7	1.0	1.0
8	1.3	0.5
9	0.6	0.4
10	0.0	0.1

Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

Table 8: Number of regional households by banded proportion of basic income required for fuel (2009) (See related Figure 23 chart)

	More than 20%	15 to 20%	10 to 15%	7.6% (national mean) to 10%	5% to 7.6% (national mean)	2 to 5%	Under 2%
North East	53,500	61,200	186,000	147,700	294,200	368,400	16,900
North West	136,000	143,800	446,400	413,800	711,900	1,021,700	65,500
Yorkshire and the Humber	102,000	87,200	305,100	293,700	531,600	864,800	46,800
East Midlands	90,000	87,900	230,600	228,100	469,500	722,900	33,200
West Midlands	142,500	100,200	366,600	294,300	532,300	744,300	64,700
East of England	86,500	84,700	240,500	242,700	570,700	1,016,600	146,800
London	126,400	108,500	327,900	310,800	497,000	1,301,600	358,600
South East	79,300	91,700	278,900	332,100	765,100	1,666,000	268,900
South West	86,600	78,000	249,000	307,000	511,100	898,400	99,100

Source: DECC Fuel Poverty Dataset / DCLG English Housing Survey, GLA Economics calculations

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