



Annual Fuel Poverty Statistics in England, 2022 (2020 data)

24 February 2022

National Statistics

Headline Statistics

- In 2020, there were an estimated **13.2 per cent of households (3.16 million) in fuel poverty in England** under the Low Income Low Energy Efficiency (LILEE) metric, down from 13.4 per cent in 2019 (3.18 million).
- The **aggregate fuel poverty gap** for England in 2020 was £705 million under the LILEE metric down by 2.8 per cent since 2019 (£726 million) in real terms. The **average fuel poverty gap** for England in 2020 (the reduction in fuel costs needed for a household to not be in fuel poverty) was estimated at £223, down by 2.3 per cent since 2019 (£229).
- In 2020, further progress was made towards the 2030 **fuel poverty target**, with 52.1 per cent of all low income households living in a property with a fuel poverty energy efficiency rating of band C or better.

Fuel poverty target	2010 progress	2019 progress	2020 progress
Band E or above by 2020	91.5	97.4	97.2
Band D or above by 2025	64.6	88.8	90.1
Band C or above by 2030	14.6	47.8	52.1

A household's fuel poverty status depends on the interaction of three key drivers:

- **Energy efficiency** – Improvement in energy efficiency between 2019 and 2020 has brought more low income households up to band C which removes them from fuel poverty.
- **Incomes** – Growth occurred in all income deciles, but the rate of growth was less in lower income deciles when compared with the median income growth.
- **Energy prices** – Between the 2019 and 2020 fuel poverty datasets energy prices fell by 2.6 per cent in real terms as wholesale energy prices fell at the start of the pandemic. Prices for prepayment meter consumers increased by 0.6 per cent in real terms. Lower prices can bring a household's income after fuel bills above the low income threshold.

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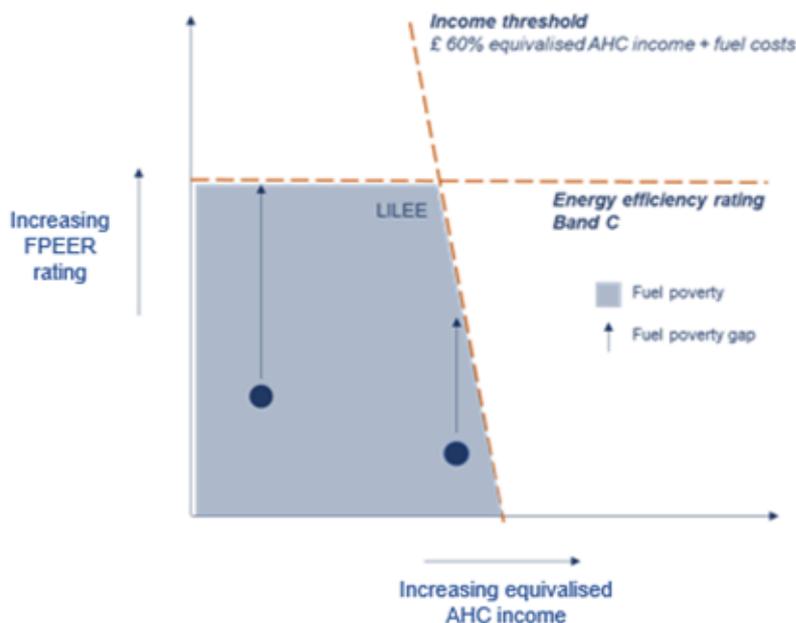
Chapter 1: Introduction

This annual publication provides a comprehensive view of the latest statistical trends and analysis of fuel poverty in England in 2020.

Fuel poverty in England is measured using the Low Income Low Energy Efficiency (LILEE) indicator, which considers a household to be fuel poor if:

- it is living in a property with an energy efficiency rating of band D, E, F or G as determined by the most up-to-date [Fuel Poverty Energy Efficiency Rating \(FPEER\) Methodology](#) - this is depicted by the horizontal threshold in Figure 1; and
- its disposable income (income after housing costs (AHC) and energy needs) would be below the poverty line¹ as depicted by the vertical sloping threshold in Figure 1.

Figure 1: The LILEE metric including the fuel poverty gap



The 2014 fuel poverty target for England set an objective to ensure that as many fuel poor households as reasonably practicable achieve a minimum energy efficiency rating of band C^{2,3} by 2030, with interim targets of band E by 2020, and band D by 2025.

The primary purpose of the Annual Fuel Poverty Statistics is to monitor progress against the statutory target and track the proportion of households in fuel poverty and their fuel poverty gap⁴.

¹ The poverty line (income poverty) is defined as an equivalised disposable income of less than 60% of the national median in Section 2 of the ONS publication [Persistent poverty in the UK and EU: 2017](#).

² Energy efficiency rating is measured using Fuel Poverty Energy Efficiency Rating (FPEER), see Section 2.3.3 and glossary for more detail.

³ Household energy efficiency ratings are banded from G (lowest) to A (highest).

⁴ Fuel poverty gap is the reduction in fuel bill that a fuel poor household needs to not be classed as fuel poor.

In addition to the headline results, the key drivers of fuel poverty are presented in Chapter 2, with detailed analysis of the prevalence and severity of fuel poverty by various household and dwelling characteristics in Chapter 3. Detailed data tables are published alongside this report (see Annex G for details of published tables).

The fuel poverty statistics, and underlying data, form a key element of the evidence base supporting BEIS to:

- Implement the [Fuel Poverty Strategy](#)
- Inform [Clean Growth Strategy](#) ambitions
- Develop, monitor and evaluate key policies including the [Energy Company Obligation \(ECO\)](#), [Warm Home Discount](#), [Green Homes Grant](#) and [Private Rented Sector Minimum Energy Efficiency Standards](#)

The Government is interested in the amount of energy households need to consume to have a warm, well-lit home, with hot water for everyday use, and the running of appliances. Fuel poverty is therefore measured based on required energy bills rather than actual spending. This ensures that those households who have low energy bills simply because they actively limit their use of energy at home, by not heating their home for example, are not overlooked.

A [methodology handbook](#) has been published alongside this publication. This sets out the method for calculating the headline statistics using the LILEE indicator and the detailed methodology for calculating the income, energy efficiency and fuel prices for each household.

1.1 Fuel Poverty Strategy

The Government published the Fuel Poverty Strategy, [Sustainable warmth: protecting vulnerable households in England](#), in February 2021. The Strategy confirmed a new fuel poverty metric, Low Income Low Energy Efficiency (LILEE).

1.2 Data

These statistics are based on data collected in the [English Housing Survey \(EHS\)](#), which is a continuous national survey commissioned by the Department for Levelling up, Housing & Communities (DLUHC). It collects information about people's housing circumstances and the condition and energy efficiency of housing in England.

This report is based on fieldwork carried out between April 2019 and March 2021 (with a mid-point of 1st April 2020). The sample comprises 11,152 occupied dwellings where a physical inspection and a household interview was carried out; this is hereby referred to as the 2020 data. Further information, including EHS releases and a detailed survey guide for users, can be found at the [EHS publication page](#).

A number of changes had to be made to the survey during 2020-21, due to survey restrictions during the pandemic. The impact of these is explored in Annex B.

This publication includes a range of tables for 2020 and timeseries data to 2010 which are described in Annex G. The 2020 fuel poverty dataset will be made available later this year via the UK Data Service. This dataset contains the underlying data used to calculate fuel poverty

and the corresponding breakdown variables used within the fuel poverty report. Documentation covering variable names and descriptions are also provided alongside the datasets.

The majority of fuel poverty variables are included in the dataset deposited at the UK Data Service under the standard End User Licence. To comply with data protection, supplementary fuel poverty variables are released under a more restricted Special Licence on the UK Data Service. To maintain the confidentiality of respondents, disclosure control is applied to both the End User Licence and Special Licence fuel poverty datasets on the UK Data Service.

Please note: users will need to register with the [UK Data Service website](#) to access the data.

1.3 Sub-regional data

This report provides estimates for fuel poverty at regional level in England but does not include estimates for sub-regional data. These cannot be measured directly from survey data due to small sample sizes. Separate modelling is used to produce the estimates at local authority, lower super output area and parliamentary constituency levels with the 2020 figures due to be published on 28th April. Previous sub-regional figures are available at the [Fuel Poverty sub-regional statistics publication webpage](#).

Chapter 2: Key Drivers of Fuel Poverty in England, 2020⁵

2.1 Overview: fuel poverty in England

In 2020, 13.2 per cent of households in England (3.16 million households) were classed as fuel poor, a reduction of 0.2 percentage points (18,000 households) from 2019.

The depth of fuel poverty is measured by the fuel poverty gap. The fuel poverty gap is the reduction in fuel costs needed for a household to not be in fuel poverty. This is either the change in required fuel costs associated with increasing the energy efficiency of a fuel poor household to a Fuel Poverty Energy Efficiency Rating (FPEER) of at least 69 (band C threshold) or reducing the costs sufficiently to meet the income threshold. The average fuel poor household would require a reduction of £223 to their fuel costs to be moved out of fuel poverty, this is the average fuel poverty gap (referred to hereafter as simply the gap). The average gap in 2020 is 2.3 per cent lower than 2019 and 34 per cent lower than 2010 in real terms⁶. We recommend using the gap, in conjunction with the proportion, as an indication of fuel poverty at the national level. The changes in the proportion of households in fuel poverty and the average gap are not statistically significant year on year – see [Annex A](#).

The aggregate fuel poverty gap, which is the total of all fuel poverty gaps for households in England decreased by 2.8 per cent since 2019 and Table 2.1 below summarises these figures.

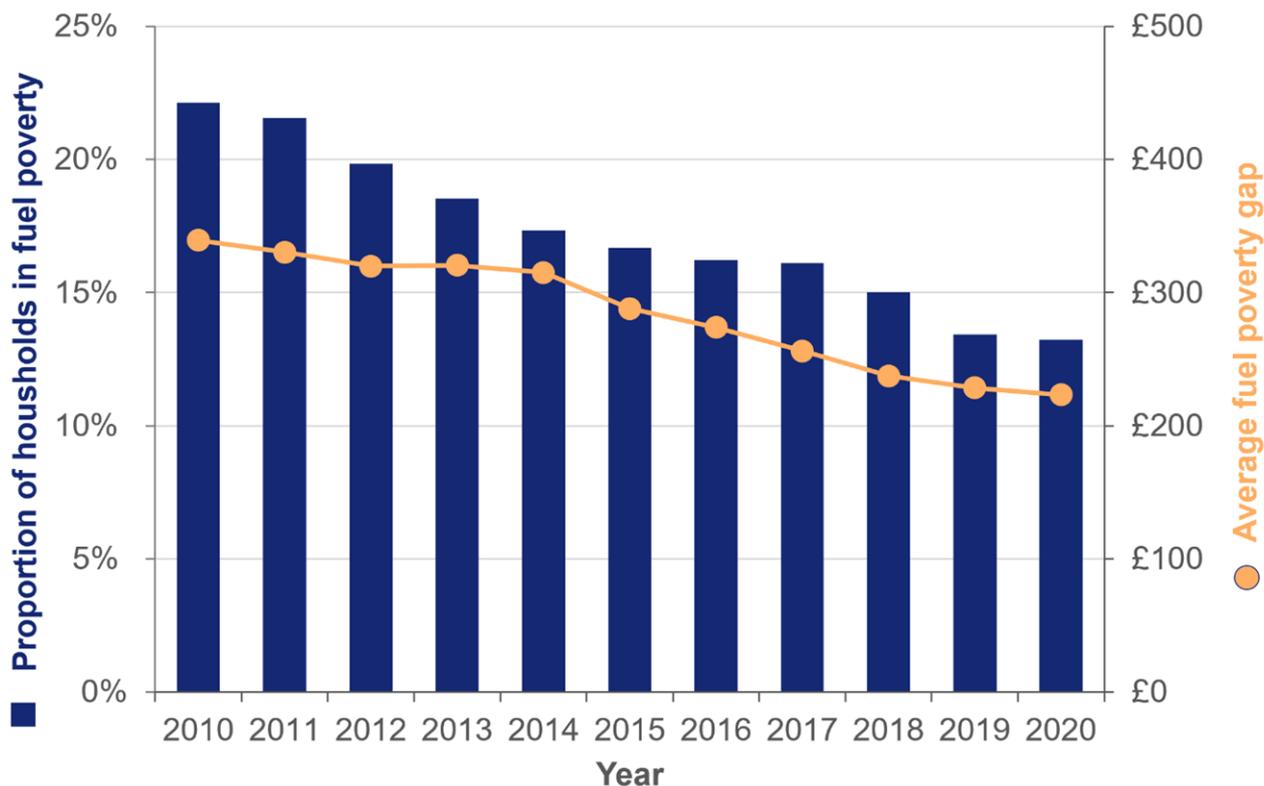
Table 2.1: In 2020 the proportion of households in fuel poverty and the aggregate gap decreased compared to 2010 and 2019

Headline measure	2010	2019	2020
Average gap (£)	339	229	223
Aggregate gap (£ millions)	1,622	726	705
Proportion of households in fuel poverty (%)	22.1	13.4	13.2
Number of households in fuel poverty (millions)	4.78	3.18	3.16

⁵ Note that caution should be used when interpreting year on year changes as the sample is not independent; fuel poverty is based on a two year combined sample (see Annex C).

⁶ The average gap and aggregate gap figures are adjusted to 2020 prices produced using the Gross Domestic Product (GDP) deflators (December 2021), [published in January 2022](#).

Figure 2.1: Following a steady decrease over time, the proportion of fuel poor households fell slightly to 13.2 per cent in 2020 while the average gap fell to £223 in real terms.^{7,8}



The share of homes in fuel poverty has reduced every year since 2010 with energy efficiency the key driver. While strong progress in energy efficiency was seen between 2019 and 2020, a change in the income distribution has reduced the extent to which this translates into fewer fuel poor households in 2020.

The main reason for the reduction in fuel poor households in 2020 was energy efficiency. 52.1 per cent of low income homes achieved an energy efficiency rating of band C or higher, up from 47.8 per cent in 2019 and just 14.6 per cent in 2010.

The average fuel poverty gap has shown a steady reduction over time as households have moved closer to the absolute energy efficiency threshold. This reduces the gap between their current required fuel costs and the required fuel costs for that household at band C. Between 2019 and 2020 the average fuel poverty gap fell slightly due to the combination of improved energy efficiency and lower real terms fuel prices for most consumers.

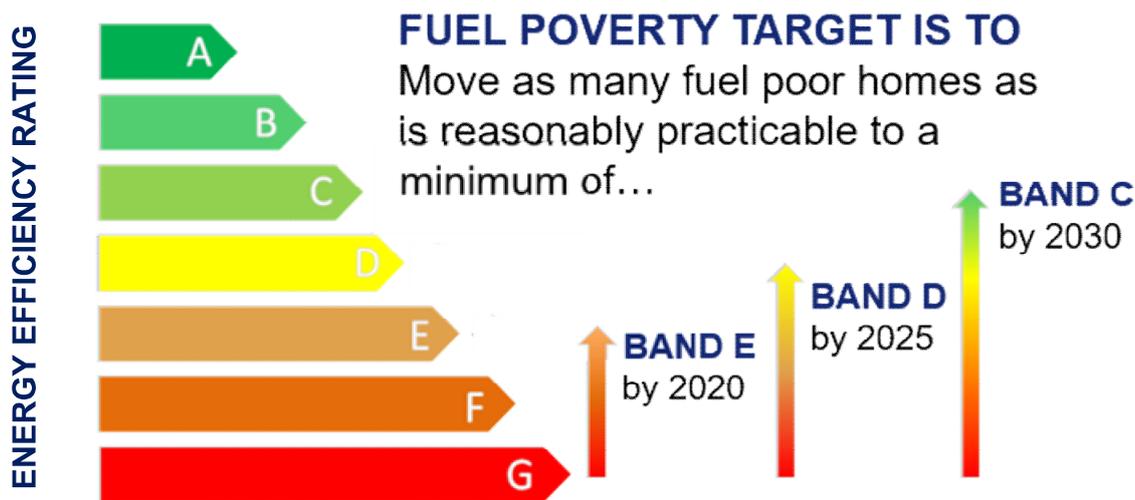
⁷ In Annex A error bars have been added to this line to denote the confidence interval around the figures.

⁸ Left axis: blue bars show the proportion of households in fuel poverty. Right axis: orange dots show the average fuel poverty gap.

2.2 Progress against the target

In 2014, the Government put in place a new statutory fuel poverty target for England: to ensure that as many fuel poor households as reasonably practicable achieve a minimum energy efficiency rating of band C^{9,10} by 2030, with interim targets of band E by 2020, and band D by 2025 (see Figure 2.2).

Figure 2.2: England's statutory fuel poverty target



Under the Low Income Low Energy Efficiency (LILEE) metric, a household that achieves a fuel poverty energy efficiency rating of band C or above would not be measured as fuel poor, and therefore fuel poverty would be eradicated if all low income households achieved an energy efficiency band C rating, providing an absolute metric for the target. Progress towards the fuel poverty target is measured as the share of all low income households who achieve an energy efficiency band C in 2030 and the interim milestones.

The proportion and number of fuel poor households in each band are reported annually to track progress against the target. Figure 2.3, Table 2.2 and Table 2.3 show that further progress was made towards the 2030 fuel poverty target and 2025 interim milestone in 2020.

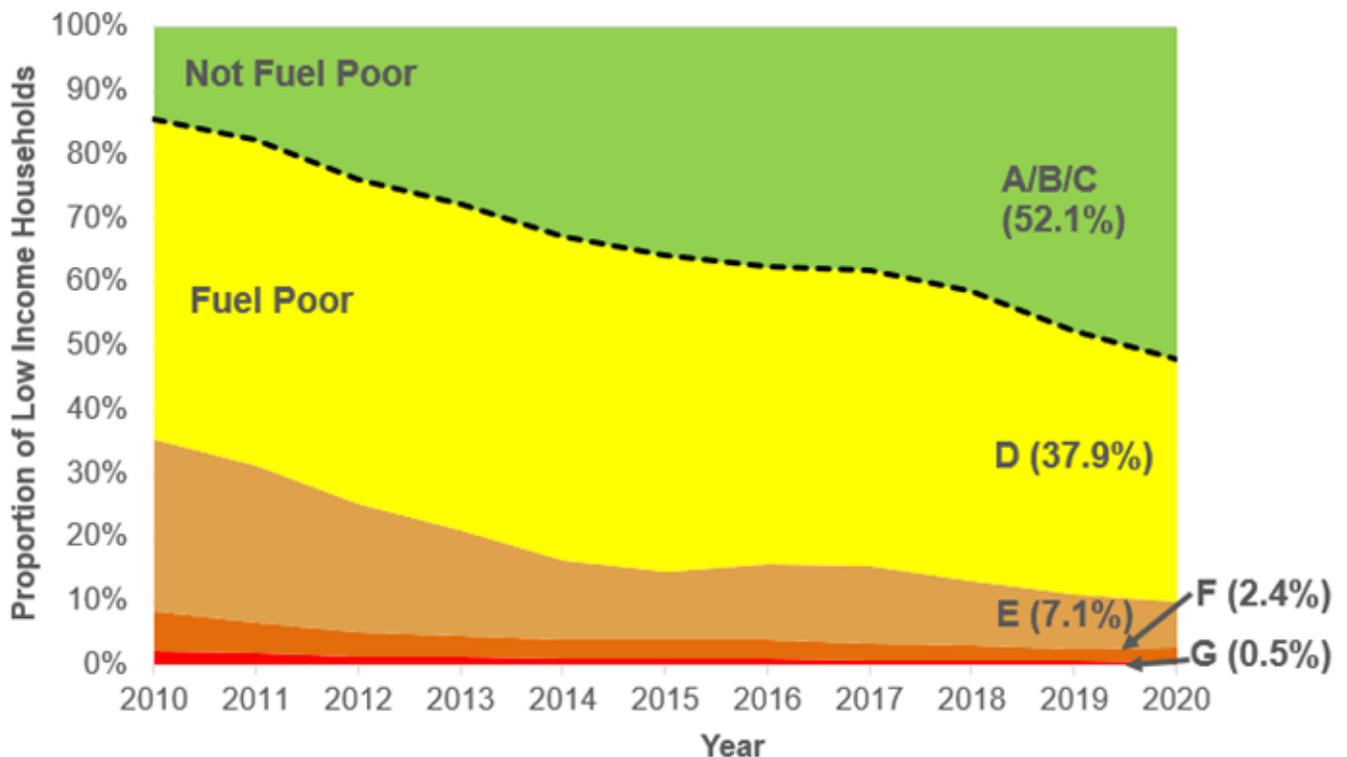
⁹ Energy efficiency rating is measured using Fuel Poverty Energy Efficiency Rating (FPEER), see Section 2.3.3 and glossary for more detail.

¹⁰ Household energy efficiency ratings are banded from G (lowest) to A (highest).

Table 2.2: In 2020, further progress was made towards the fuel poverty target and interim milestones

Fuel poverty target	2010 progress	2019 progress	2020 progress
Band E or above by 2020	91.5	97.4	97.2
Band D or above by 2025	64.6	88.8	90.1
Band C or above by 2030	14.6	47.8	52.1

Figure 2.3: Percentage of low income households in band A to C was 52.1 per cent and band A to E was 97.2 per cent in 2020¹¹



¹¹ Figures for energy efficiency band G are based on small sample sizes, inferences should not be made based on this figure.

Table 2.3: Proportion and number of low income households in each band, 2010, 2019 and 2020

Low income households in each FPEER band	2010		2019		2020	
	(%)	No. households (000's)	(%)	No. households (000's)	(%)	No. households (000's)
Band A/B/C	14.6	814	47.8	2,903	52.1	3,438
Band D	50.0	2,797	41.1	2,496	37.9	2,502
Band E	27.0	1,509	8.6	522	7.1	470
Band F	6.3	353	2.0	121	2.4	156
Band G	2.2	121	0.6	37	0.5	30

2020 interim target – In 2020, an estimated 97.2 per cent of low income households were living in properties with an energy efficiency rating in band A to E and as shown in Figure A.3 the confidence interval is estimated to be between 96.4 per cent and 97.9 per cent. There are an estimated 186,000 F and G rated low income homes remaining, down by 61 per cent since 2010. When sample variation is considered this is unchanged from 2019.

It is therefore estimated that between 140 and 240 thousand low income households remain in band F and G properties.

2025 interim target progress – 90.1 per cent of low income households were living in properties with energy efficiency rating in band A to D, an increase of 25.5 percentage points since 2010 and 1.3 percentage points since 2019.

2030 target progress – 52.1 per cent of low income households were living in properties with an energy efficiency rating of A, B or C, an increase of 37.5 percentage points since 2010 and 4.3 percentage points since 2019. Overall, nearly half of all households (47.8 per cent) have an energy efficiency rating of A, B or C.

2.3 Key drivers

The fuel poverty status of a household depends on the interaction between three key drivers¹²:



The key drivers will be assessed in turn to explore their effect on headline fuel poverty figures in 2020. **Increased** energy efficiency, **higher** incomes and **lower** energy prices would each have a positive impact on a fuel poor household.

The LILEE fuel poverty indicator sets an absolute energy efficiency threshold making it easier to identify the impact of changes in energy efficiency. The relative nature of the income threshold means it is harder to see the impact of changes in income and the contribution of prices since this requires an assessment of how household incomes and fuel costs change relative to the median income.

Chapter 3 explores dwelling and household characteristics that help identify where the most severe fuel poverty gaps are, and which households are in fuel poverty.

2.3.1 The Low Income Low Energy Efficiency quadrant

Fuel poverty in England is measured using the LILEE indicator, as defined in Chapter 1. Based on a combination of household income, energy requirements and energy prices, the indicator allows households to be grouped into one of the four quadrants illustrated below in Figure 2.4.

Energy Efficiency: The horizontal line provides the absolute threshold between low energy efficiency rated households (band D to G) and high energy efficiency rated households (band A to C).

Fuel costs: The Government is interested in the amount of energy households need to consume to have a warm, well-lit home, with hot water for everyday use, and the running of appliances. Fuel poverty is therefore measured based on **required** fuel costs of the energy efficiency of the home rather than **actual** spending. This ensures that households who have low energy bills simply because they actively limit their use of energy at home, for example, by not heating their home are not overlooked. An equivalisation factor is applied to reflect the different levels of energy required depending on the number of people living in the property.

¹² See Annex C: Measuring fuel poverty in England, for further explanation of how changes to key drivers affect fuel poverty figures.

Income, on the horizontal axis, is defined as equivalised income after housing costs, tax and National Insurance. Equivalisation reflects that households have different spending requirements depending on the number and age of people living in the property.

Under the LILEE indicator there is no exact point on the income axis, for a given FPEER rating, where the household would be classed as low income since this threshold is measured using income minus fuel costs. The sloping dashed line marks a line of best fit between households classed as low income and high income and shows the impact of higher fuel costs in low energy efficiency households. The variation in fuel costs for a given FPEER is due to factors including property size, household size, occupancy pattern.

Further information on how income and fuel costs are calculated can be found in Sections 3 and 5 of the [Methodology Handbook](#).

Figure 2.4: 13.2 per cent of all households classified as fuel poor (LILEE) in 2020¹³



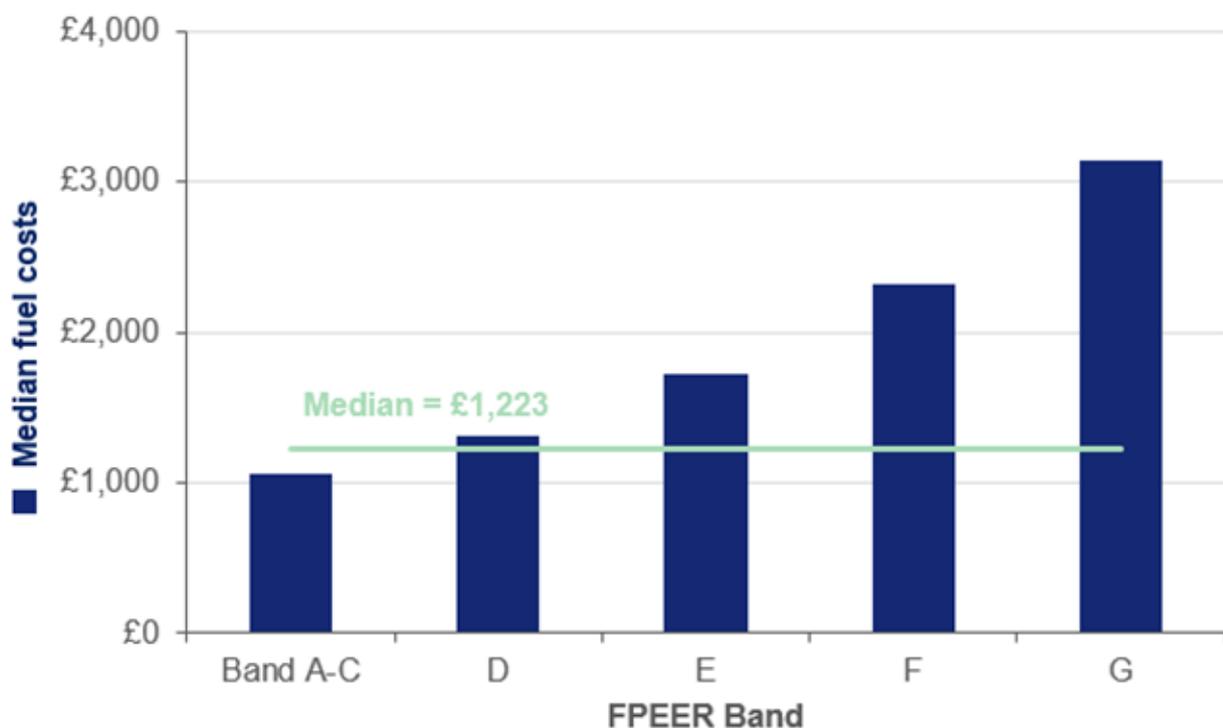
In 2020, 27.6 per cent of households were classed as having a low income (with 72.4 per cent having a high income). Overall, 52.2 per cent of households were classed as low energy efficiency. Of those households with low incomes, 47.9 per cent were classed as low energy efficiency and hence fuel poor based on having an energy efficiency rating of band D or below.

¹³ In line with [Canberra Group Handbook](#) guidance, negative AHC incomes have been set to zero following equivalisation. For more information, see Section 3 of the [methodology handbook](#).

2.3.3 Energy efficiency

Energy efficiency is a key driver of fuel poverty, as higher energy efficiency reduces a household's fuel costs for a particular size of property. The LILEE metric also sets an absolute threshold above which a household cannot be fuel poor (FPEER band C) regardless of income. Using an absolute threshold also means that once a property attains this threshold it is unlikely to fall unless energy efficiency measures are removed or in cases where the energy efficiency rating includes the receipt of Warm Home Discount.

Figure 2.5: Fuel costs for the least efficient¹⁴ properties (band G) are almost three times higher than costs for the most efficient properties (band A-C) in 2020



Fuel poverty modelling is based on the estimated fuel costs of a household's theoretical energy consumption since this provides a consistent assessment using the Standard Assessment Procedure (SAP)¹⁵ and BREDEM occupancy patterns, reflecting a standard achieved temperature for all households. Theoretical energy consumption and actual usage were compared in a [special feature article](#), published in March 2019. The analysis suggested that in properties rated band C or lower actual consumption is, on average, lower than the theoretical value. This difference increases as the energy efficiency of a property decreases.

For fuel poverty statistics, and to measure progress against the fuel poverty target (Section 2.2), BEIS is legally bound to use a fuel poverty specific energy efficiency rating.

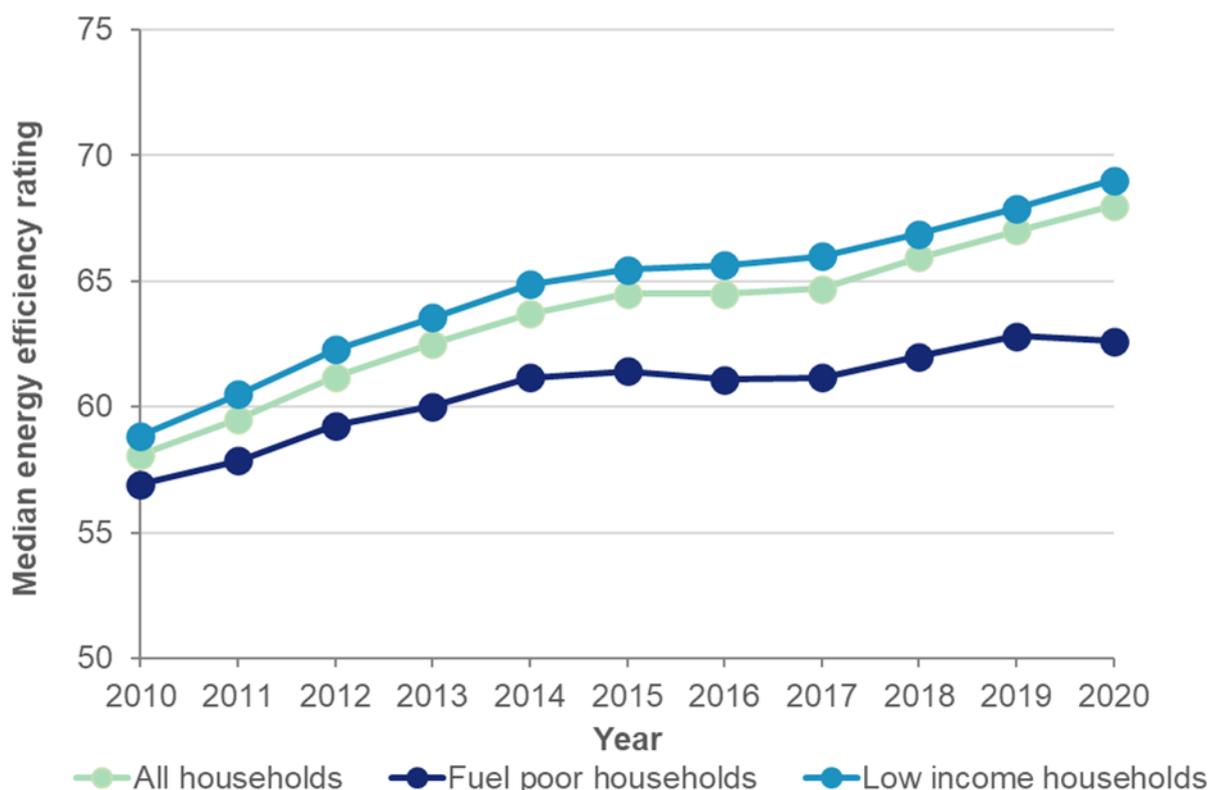
¹⁴ Energy efficiency measured using FPEER.

¹⁵ Every household in England can be assessed using SAP, and a score 1-100 awarded, with 1 indicating the least energy efficient and 100 being the highest. For the purposes of Energy Performance Certificates (EPC), SAP scores are banded to give a rating A-G, A being the highest.

The fuel poverty energy efficiency rating ([FPEER](#)) (from hereafter referred to as energy efficiency rating), is based on SAP, but accounts for the impact of policies which discount households' energy bills (e.g. the [Warm Home Discount](#)). For example, if a household has a band D Energy Performance Certificate (EPC) and they get £140 deducted from their energy bill due to receipt of the Warm Home Discount, this could move them into an FPEER band C.

Depending on the size and efficiency of a home together with current prices, the amount of uplift from Warm Home Discount in terms of SAP points varies. In 2020, D rated properties typically saw an increase of around 5½ points compared to F rated home that only increased by 4 points. This is due to the rebate of a fixed value being a lower share of fuel costs for low energy efficient homes.

Figure 2.6: Median energy efficiency ratings increased between 2019 and 2020 for low income and all households (including impact of WHD)



The median energy efficiency rating for all households increased strongly in recent years, after it had levelled off between 2015 and 2017. A similar trend is seen for low income households who would be fuel poor if living in a home rated D-G. Low income homes continue to have a higher median energy efficiency rating than all households mostly due to the impact of Warm Home Discount.

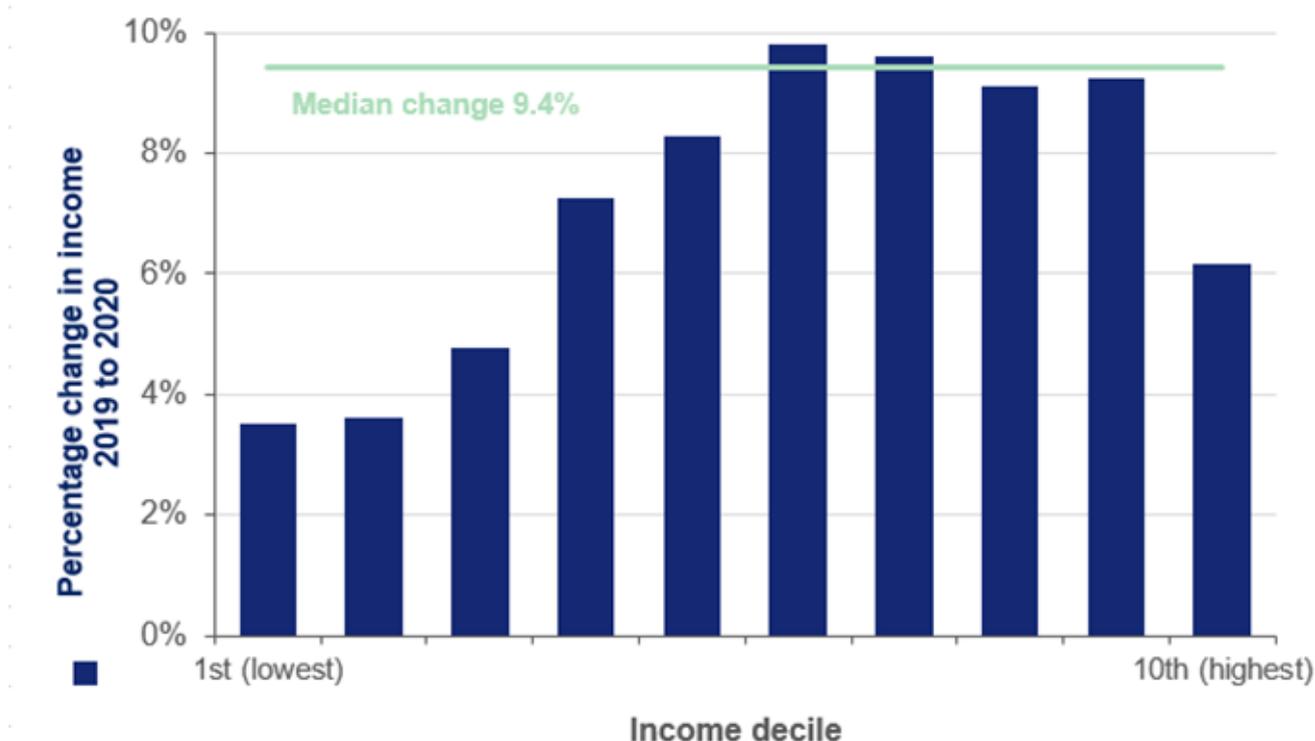
The rate of growth specifically among fuel poor households is slowest since improvements which take a household to band C remove them from fuel poverty and therefore this improvement is not seen in this group. It did increase between 2017 and 2019 but it is estimated that average energy efficiency rating increased by an additional 0.7 SAP points over

that period due to methodology improvements to the calculation of SAP ratings.¹⁶ In all other years since 2014 this rating has remained constant.

2.3.4 Income

Income is one of the three key drivers of fuel poverty and determines whether a household is classed as “low income” or “high income”. Changes to occupants’ earnings, benefits and housing costs all affect household income. In 2020, a household is classed as low income if their equivalised income (less tax and National Insurance) once they’ve paid their housing and fuel costs is less than £15,424 (60 per cent of median income for all households)¹⁷.

Figure 2.7: The growth in incomes in lower deciles was less than the median income growth between 2019 and 2020



The proportion of households classed as low income increased from 25.7 per cent in 2019 to 27.6 per cent in 2020, because the growth in incomes between 2019 and 2020 in the 3rd decile was significantly lower than the median income growth of 9.4 per cent. The marginal fuel poor households are usually within the 3rd income decile but based on the income distribution in 2020, more of the 3rd decile fell below the income threshold.

There is evidence to suggest that the incomes modelled during the 2020/21 survey year are artificially high due to a combination of factors caused by the survey approach introduced due to the pandemic. In particular, the survey recorded a lower average household size which increases the equivalised income due to lower equalisation factors used for smaller households. The full range of factors affecting this are discussed in Annex B, but while the actual value of the incomes and rate of growth this year seem high, we do consider this a

¹⁶ See Figure 2.10 in the [2020/2021 EHS headline report](#).

¹⁷ In the 2020 Fuel Poverty dataset, the median (after housing costs equivalised income for all households) = £25,707 so 60 per cent of the median = £15,424. See Figure 2 in the [methodology handbook](#).

reasonable reflection of the change in the shape of the income distribution from which the relative fuel poverty income metric is calculated.

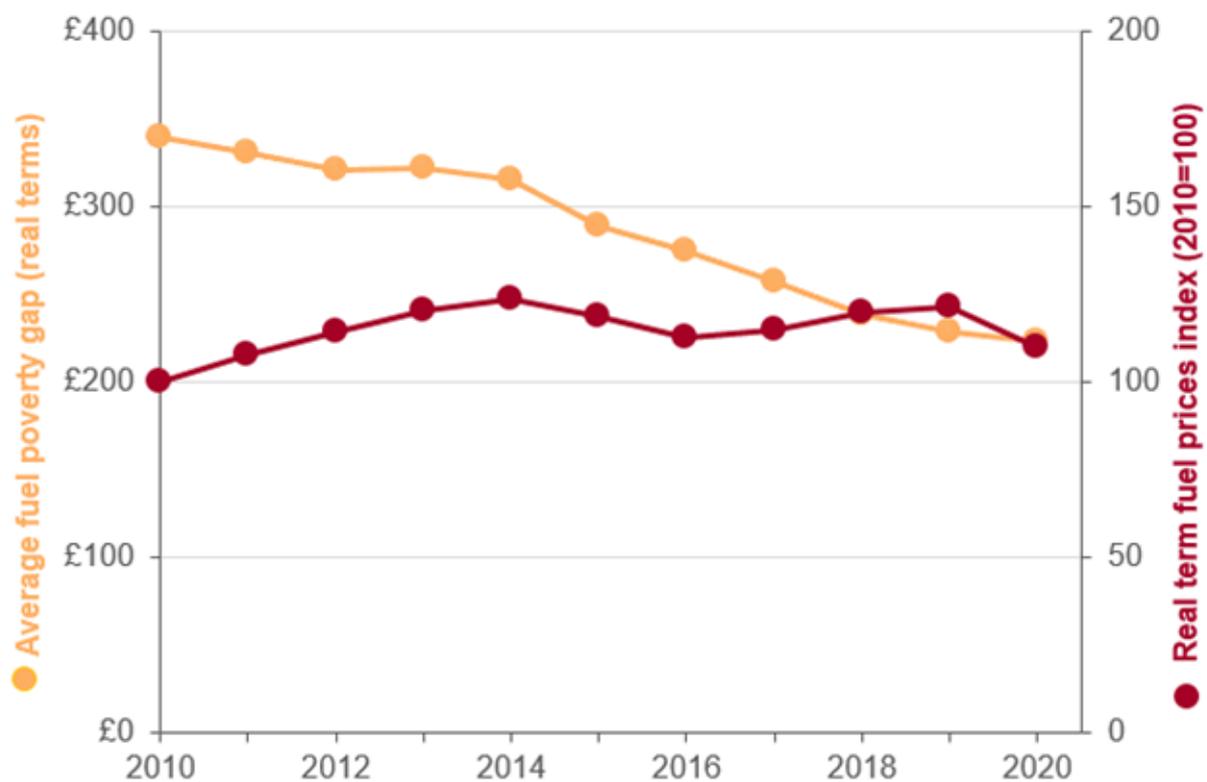
The overall rate of fuel poverty fell from 13.4 per cent in 2019 to 13.2 per cent in 2020 despite strong improvement in energy efficiency as this has been offset by the change in the income distribution. If the share of low income households had remained the same as in 2019 this energy efficiency progress would have resulted in a much lower level of fuel poverty in 2020 of around 12.3 per cent.

2.3.5 Energy prices

Energy prices are used to calculate how much the required energy for each household would cost for that specific year. The required energy bill for each household is subtracted from the equivalised household income and hence determines if a household is classified as low income.

In 2020, fuel poor households were required to spend a median cost of £1,341 on their energy bills, 32 per cent more (£323) than Low-Income High Energy Efficiency households. Characteristics of the dwelling and household which contribute to these higher costs are explored in detail in Chapter 3.

Figure 2.8: The average fuel poverty gap has shown a steady reduction as fuel poor homes are brought closer to the band C threshold through a period of stable historic energy prices.^{18,19}



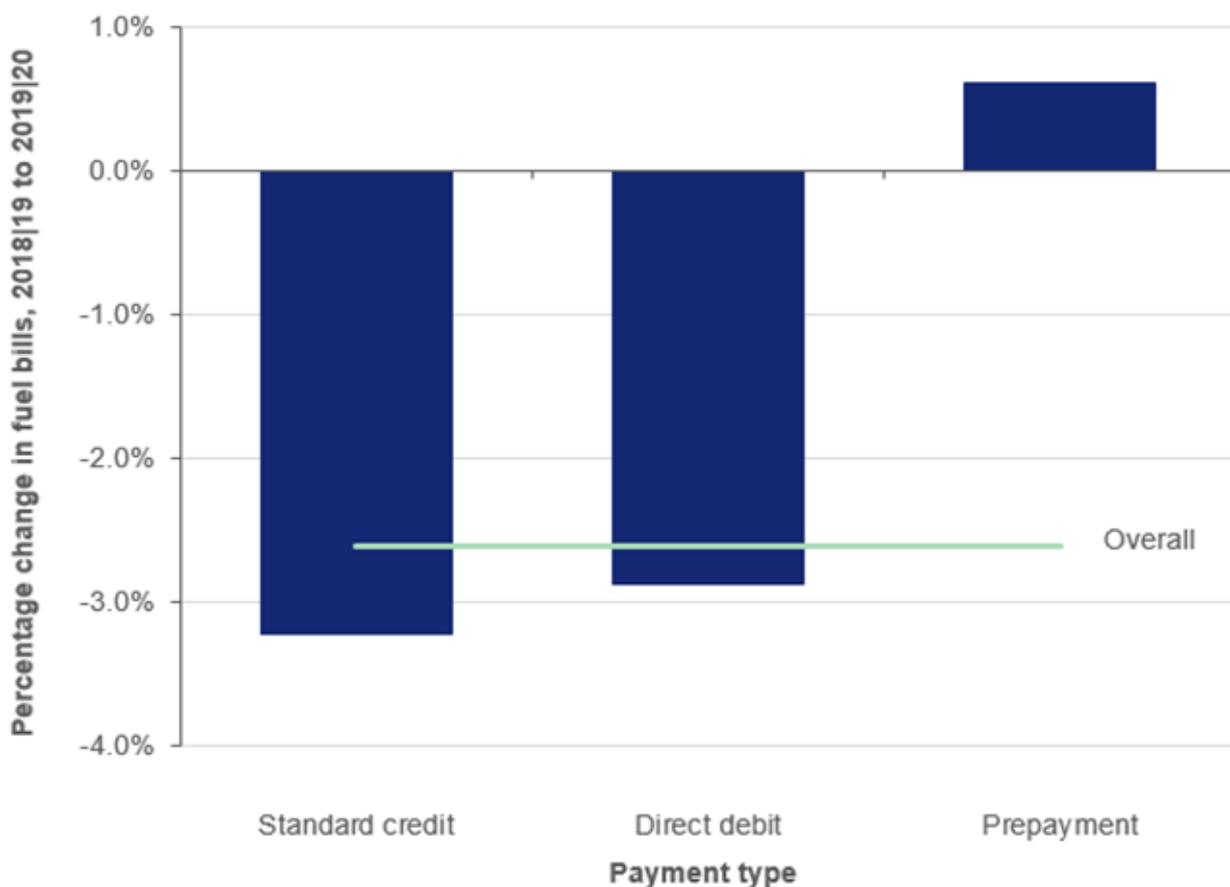
¹⁸ Produced using the Gross Domestic Product (GDP) deflators (December 2021), [published in January 2022](#).

¹⁹ Real term fuel prices index taken from Quarterly [Energy Prices table 2.1.2](#).

Figure 2.8 shows a larger reduction in real prices than has been seen in the fuel poverty modelling as a 2-year dataset is used, so only half the sample has seen the price reduction due to the slowdown in global energy demand in 2020. The overall impact of fuel prices in the fuel poverty dataset is shown in Figure 2.9.

Under the LILEE metric the primary driver of the fuel poverty gap will be energy efficiency but the reduction in the gap between 2012 and 2014 was held up by rising prices.

Figure 2.9: The overall average domestic gas and electricity bill decreased by 2.6 per cent between 2018|2019 and 2019|2020 in real terms (fixed level of consumption)²⁰



Fuel poverty estimates are based on two years of survey data, so this price comparison is of prices used for the 2019 fuel poverty statistics (2018 & 2019 prices) and 2020 statistics (2019 & 2020 prices).

The rate at which average domestic gas and electricity prices have changed differs depending on payment method. The average total dual fuel bill for households paying for their energy by prepayment meter increased by £8 (0.6 per cent) over the last two years. Standard credit remains the most expensive form of payment, 5 per cent higher than prepayment in 2019|20 down from 9 per cent in 2018|19, see Tables A.1 and A.2 in Annex A.

²⁰ Source: [Annual domestic price statistics](#), Table 2.2.2 and Table 2.3.2. Figures are based on Standard Electricity tariffs, are in real terms and cover England and Wales. Data for gas and electricity separately can be found in Annex A. Prices for non-metered fuels used in fuel poverty modelling, see section 4 of the Methodology Handbook.

Households using a prepayment electricity meter were more likely to be fuel poor, 31 per cent compared with 11 per cent for households paying by direct debit. The proportion of households paying their electricity by prepayment meter that are in fuel poverty decreased slightly from 31 per cent in 2010 to 25 per cent in 2020. The fuel poverty gap for prepayment electricity households fell from £444 in 2010 to £163 in 2020 in real terms.

Fuel poverty statistics are modelled using required fuel expenditure that takes into account the assumed heating pattern appropriate to a household's circumstances. Households are assigned one of four heating patterns depending on whether they are usually at home during the day or not and whether they under occupy their home.

During 2020/21, households spent more time at home following Government advice to work from home, school closures and other restrictions affecting normal daily activities at times during the pandemic. Some of these impacts of the pandemic are likely to cause longer term shifts in household behaviour. Looking at surveys carried in this period, 71 per cent of households said they were usually at home during the day compared with an average of 51 per cent over the previous two years.

Despite improvement in energy efficiency and a fall in real terms prices, overall median household required fuel expenditure was unchanged since 2019 at £1,223 when the additional heating hours are included.

A prepayment price cap came into force in April 2017 following an enquiry by the Competition & Markets Authority (CMA) on energy markets. The prepayment cap is a set maximum that a supplier can charge those using prepayment meters.

From January 2019 the default tariff price cap was introduced to cover all non-fixed tariffs²¹. This has reduced the growth in bills for customers on standard credit and direct debit tariffs relative to prepayment meters. The cap for prepayment meters in April 2020 was 13 per cent higher than when it was introduced in April 2017.

²¹ Information about the energy price cap can be found at the [Ofgem website](#).

Chapter 3: Detailed Analysis of Fuel Poverty in England, 2020

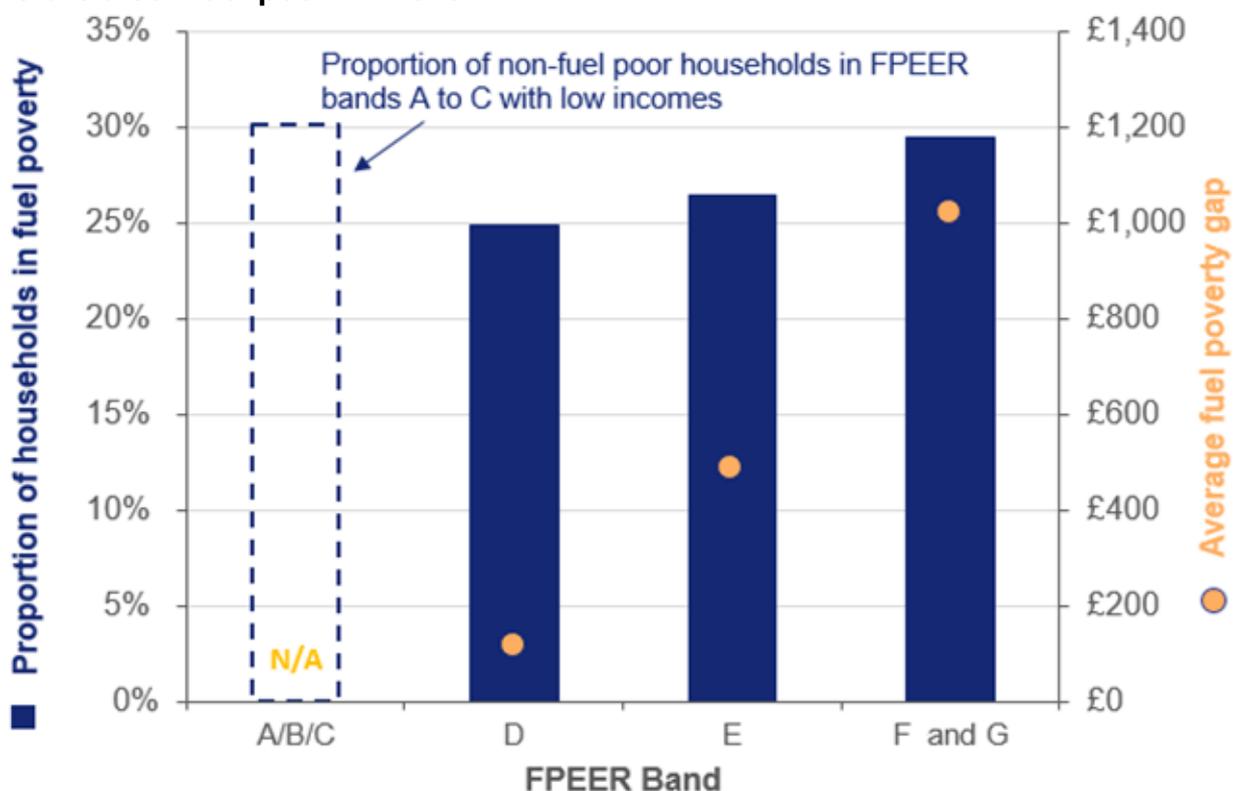
Fuel poverty in England is affected by multiple characteristics of energy efficiency, income and fuel costs. This means that assigning causality to one factor alone is not possible. The following chapter analyses these individual characteristics, but users should be aware of the built-in interactions likely to exist between them.

The data behind this analysis is available in the fuel poverty detailed, trends and supplementary tables (of median incomes, fuel costs, energy efficiency ratings and floor areas) detailed in [Annex G](#).

3.1 Property characteristics

3.1.1 Fuel Poverty Energy Efficiency Rating (FPEER)²²

Figure 3.1: Proportion of households on “low income” where households with FPEER D-G are also “fuel poor” in 2020



In Figure 3.1 above, other than for band A-C, the blue bars denote the proportion of households in fuel poverty for each group and the orange circles represent the average fuel poverty gap for each group. For example, the blue bars show that 24.9 per cent of households

²² The Fuel Poverty Energy Efficiency Rating is defined in Section 2.3.3.

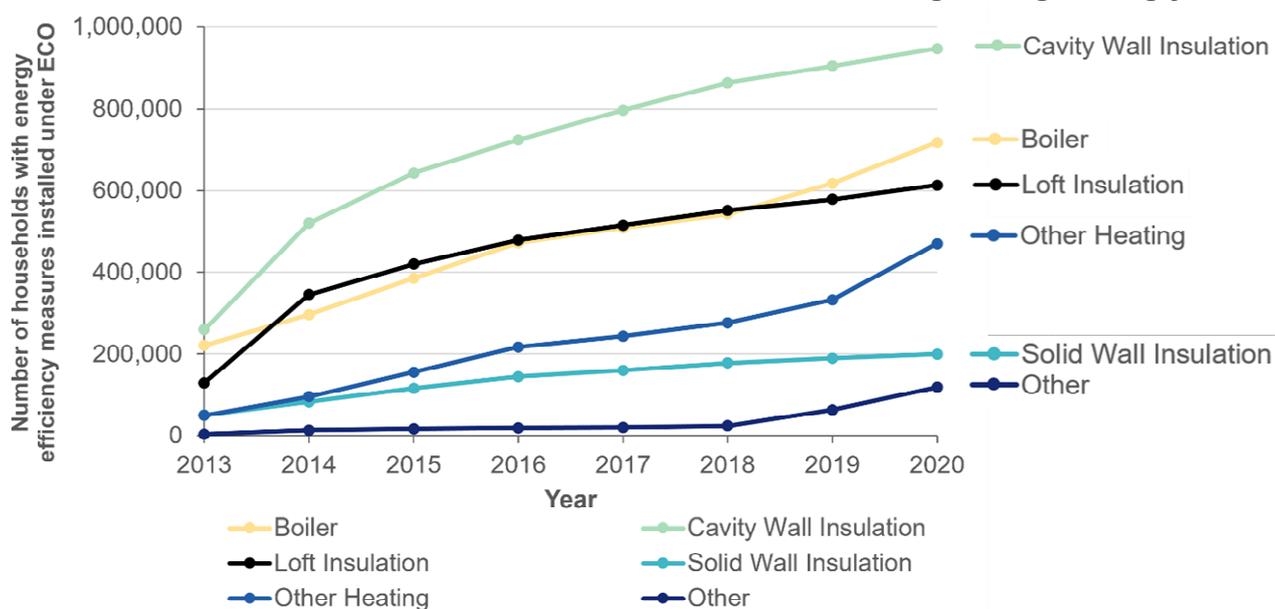
who live in energy efficiency band D properties are fuel poor and they have an average gap (shown by the orange circles) of £115.

In 2020, 79.2 per cent of all fuel poor homes were FPEER band D, up from 78.6 per cent in 2019 and reflects the increasing share of fuel poor homes getting close to band C.

The proportion of households in fuel poverty is highest in lower energy rated homes and the size of the average gap is highest for those living in band F&G properties in 2020.

By definition, households rated A-C are not fuel poor and therefore they do not have a fuel poverty gap. Between 2019 and 2020 the overall share of FPEER band A-C homes increased sharply from 42.5 per cent to 47.8 per cent. Within energy efficiency bands A-C, 30.1 per cent of households are low income²³ compared to 27.6 per cent of households overall. These households are not fuel poor since they have a high energy efficiency rating, but this demonstrates that low income households are more likely to be living in high energy efficiency rated homes.

Figure 3.2: The cumulative number of energy efficiency measures installed has increased between 2013 and 2020, with the numbers of some measures growing strongly in 2020²⁴

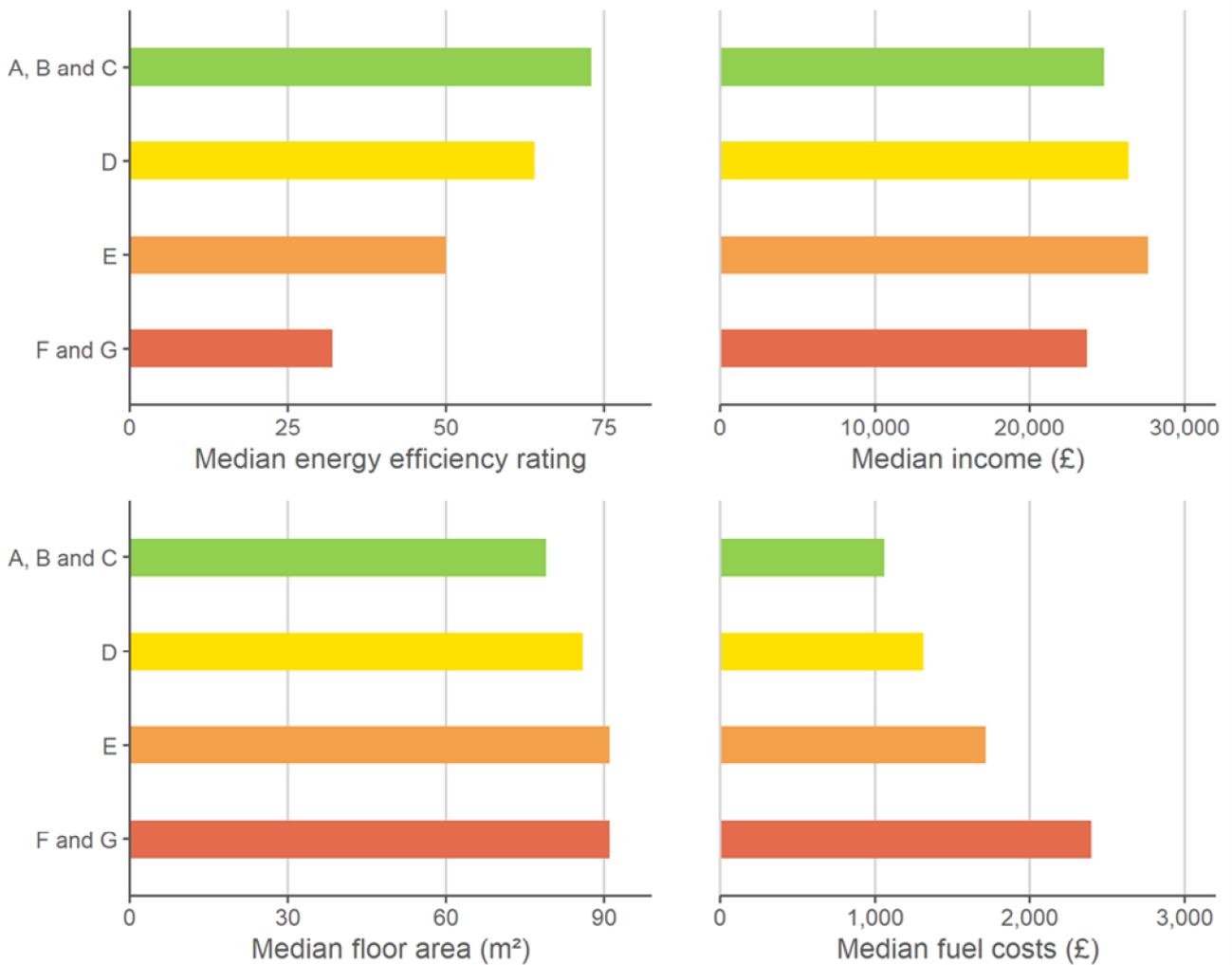


The increase in energy efficiency ratings can partly be explained by the installation of energy efficiency measures reported in the [Household Energy Efficiency National Statistics](#), see Figure 3.2. These statistics show there has been an increase in the cumulative number of energy efficiency measures installed each year through the Energy Company Obligation between 2013 and 2020. While the delivery of some measures has levelled off in recent years, the introduction of ECO3 at the end of 2018 has increased the delivery of boilers alongside supplementary insulation measures, typically under floor insulation and often heating controls.

²³ Low income is defined in section 2.3.4

²⁴ The 'Other' category includes windows and doors, micro-generation and under floor insulation and glazing measures.

Figure 3.3: As energy efficiency ratings decrease (from A to G) fuel costs tend to increase

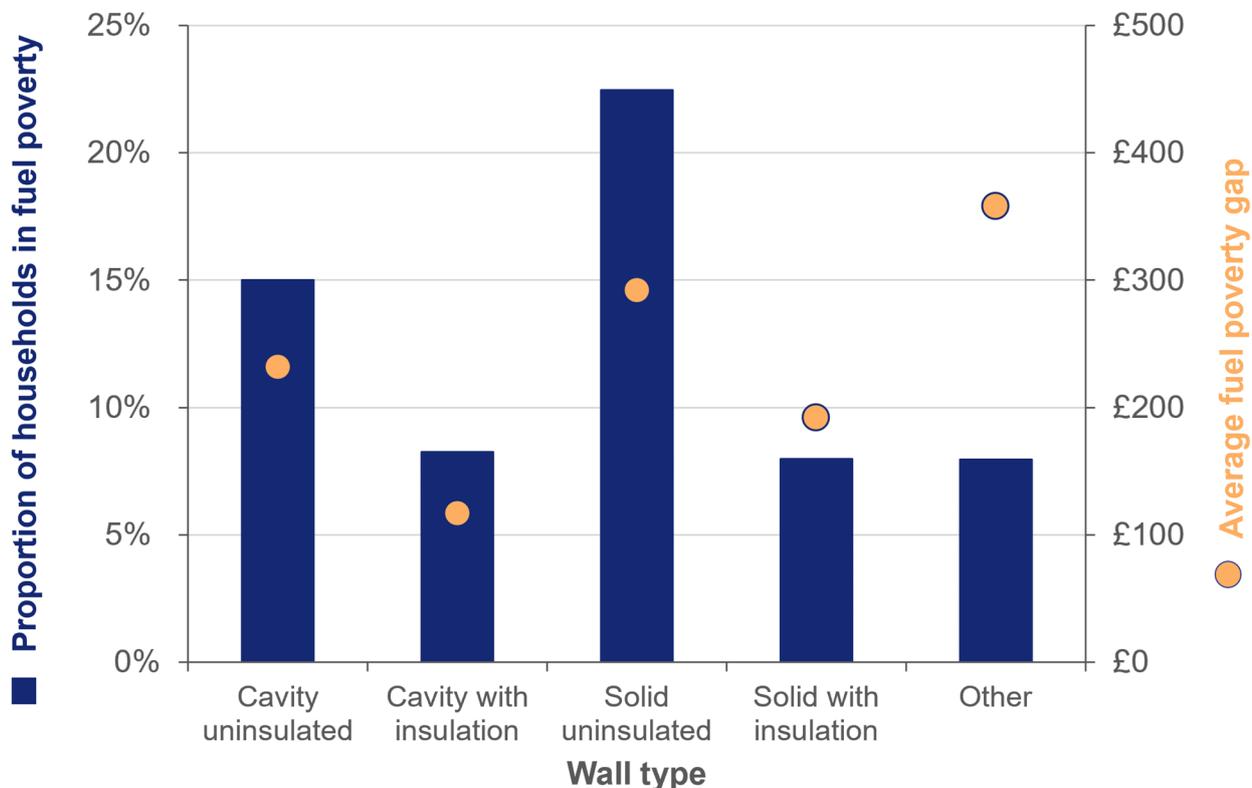


There is very strong correlation of lower required fuel costs in high energy efficiency homes both due to the rating but also reflecting that there are more smaller homes in the highest rating bands.

Other than for the very lowest efficiency homes (F and G), the lowest median income is in the highest energy efficiency rating reflecting a combination of a higher share of social housing, higher share of flats and the impact of the Warm Home Discount which is targeted to low income households and provides an uplift to their energy efficiency rating. Further detail on tenure type is discussed in Section 3.2.1.

3.1.2 Wall type

Figure 3.4: In 2020 the average gap and proportion of households in fuel poverty is highest for those living in properties with uninsulated walls²⁵



Properties with uninsulated solid walls had the highest rate of fuel poverty (22.5 per cent of households) with an average gap of £292, whereas those with insulated solid walls are less than half as likely to be fuel poor (8.0 per cent) with an average gap of £192. Properties with cavity walls follow a similar pattern – households living in properties with uninsulated cavity walls are more likely to be fuel poor (15.0 per cent) and have a larger average gap (£232) than those households living in properties with insulated cavity walls (8.3 per cent and £117).

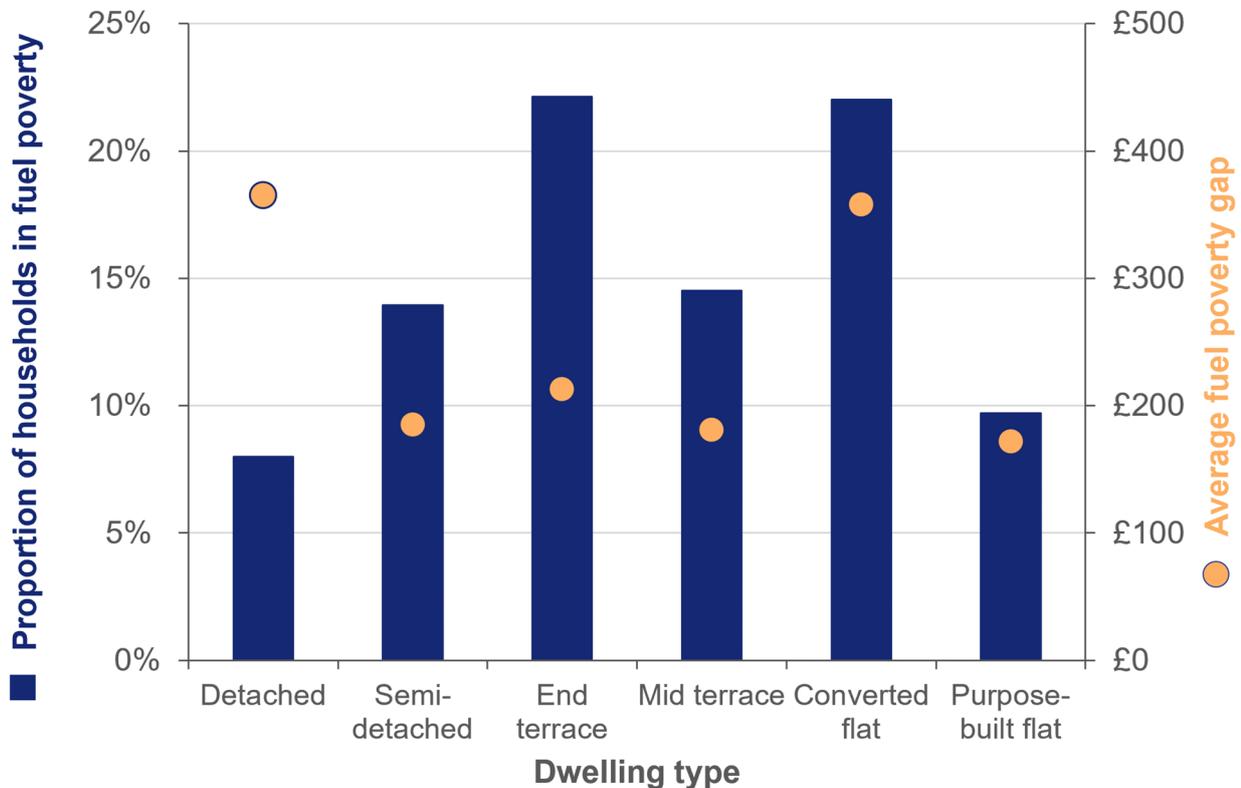
The larger average gaps and higher likelihood of fuel poverty in properties without wall insulation are likely due to these having lower energy efficiency ratings and higher fuel costs - insulated walls have a higher median energy efficiency rating than uninsulated. According to figures from the National Energy Efficiency Data-Framework (NEED), properties had median percentage consumption savings of 8.6 per cent following the installation of cavity wall insulation, and 18.0 per cent from installing solid wall insulation²⁶.

²⁵ The 'Other' category includes dwellings built with stone, pre-fab, timber and other methods. 'Other' figures based on low sample count (between 10 and less than 30), inferences should not be made based on this figure.

²⁶ Source: National Energy Efficiency Data-Framework (NEED) report: [Summary of analysis 2021](#).

3.1.3 Dwelling type

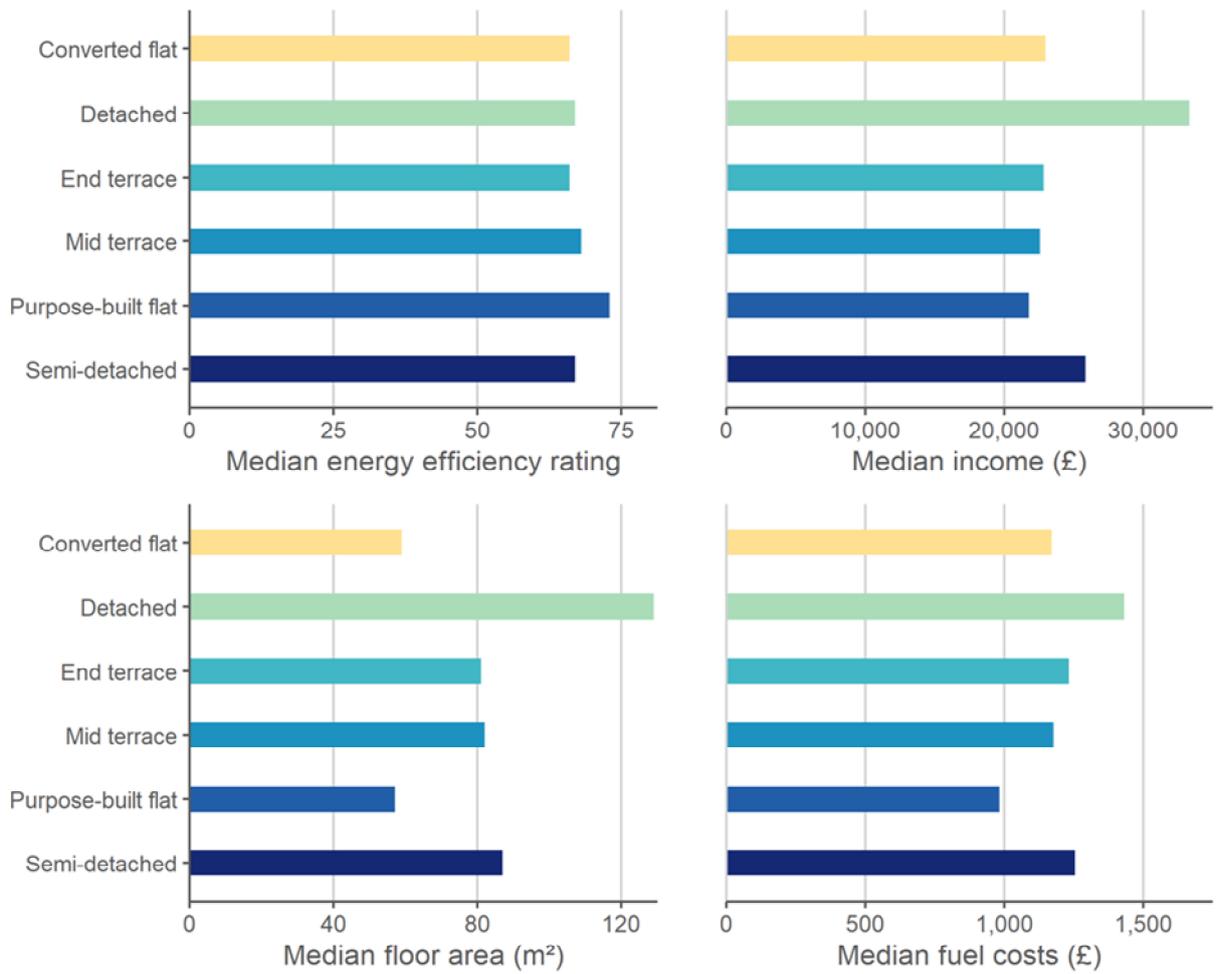
Figure 3.5: The average fuel poverty gap is highest for detached properties despite these having the lowest rate of fuel poverty in 2020



Households living in end-terraces (22.1 per cent) and converted flats (22.0 per cent) had the highest likelihood of fuel poverty. In contrast, those living in detached properties have the lowest likelihood of fuel poverty (8.0 per cent). However, households living in detached properties have the largest average gap at £365, partly due to the number of exposed walls which contribute to a lower energy efficiency rating and higher floor areas, with a median floor area of 129m², compared to semi-detached with a floor area of 87m² – the next largest. Figure 3.6 shows that households living in detached homes had much higher median incomes than other households which explains the lower levels of fuel poverty but households with the highest floor areas had the highest fuel costs and thus the highest fuel poverty gap.

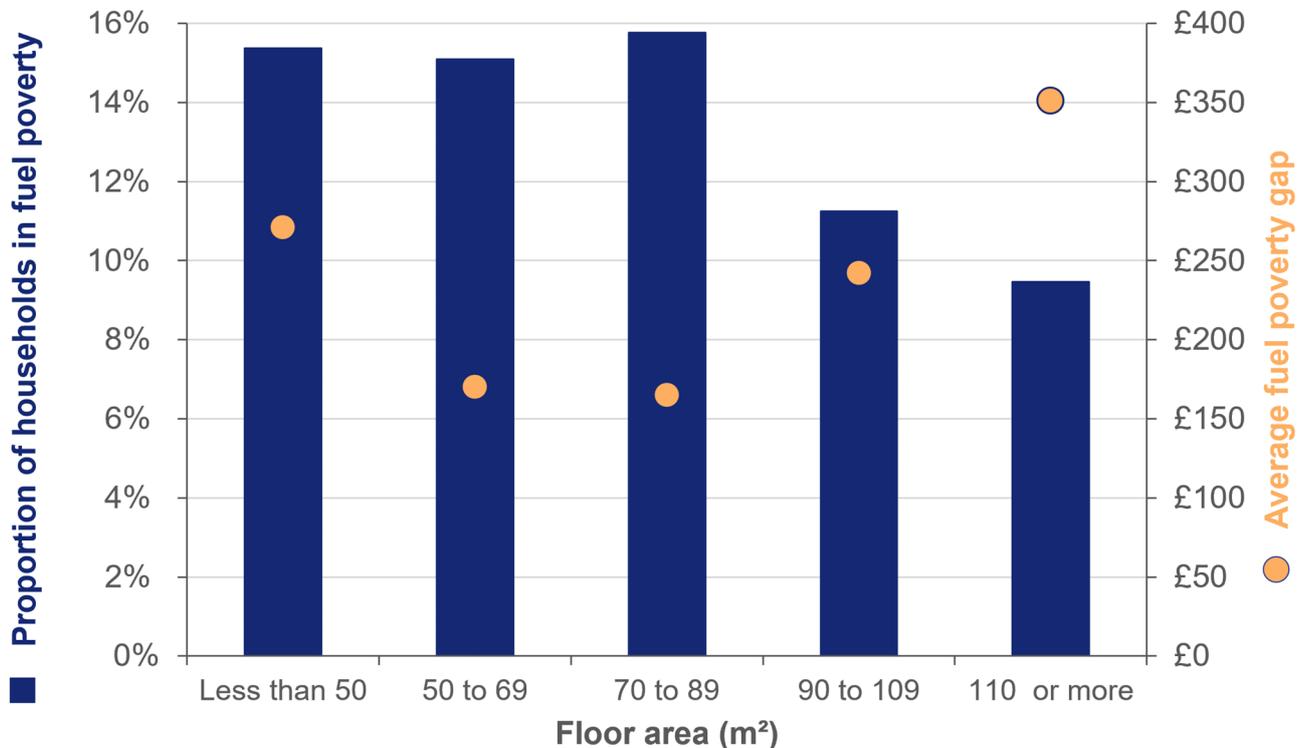
Purpose-built flats had a median energy efficiency rating of 73, compared to 66 for converted flats resulting in median fuel costs of £982 for purpose-built flats compared to £1,171 for converted flats. This is due to the nature of the build, age and standard of the property (more modern properties are built to a higher energy efficiency standard).

Figure 3.6: Purpose-built flats have the highest median energy efficiency but the lowest median income



3.1.4 Floor area

Figure 3.7: Smaller properties are more likely to be occupied by the fuel poor and properties over 110m² have the largest average gap (£351) in 2020

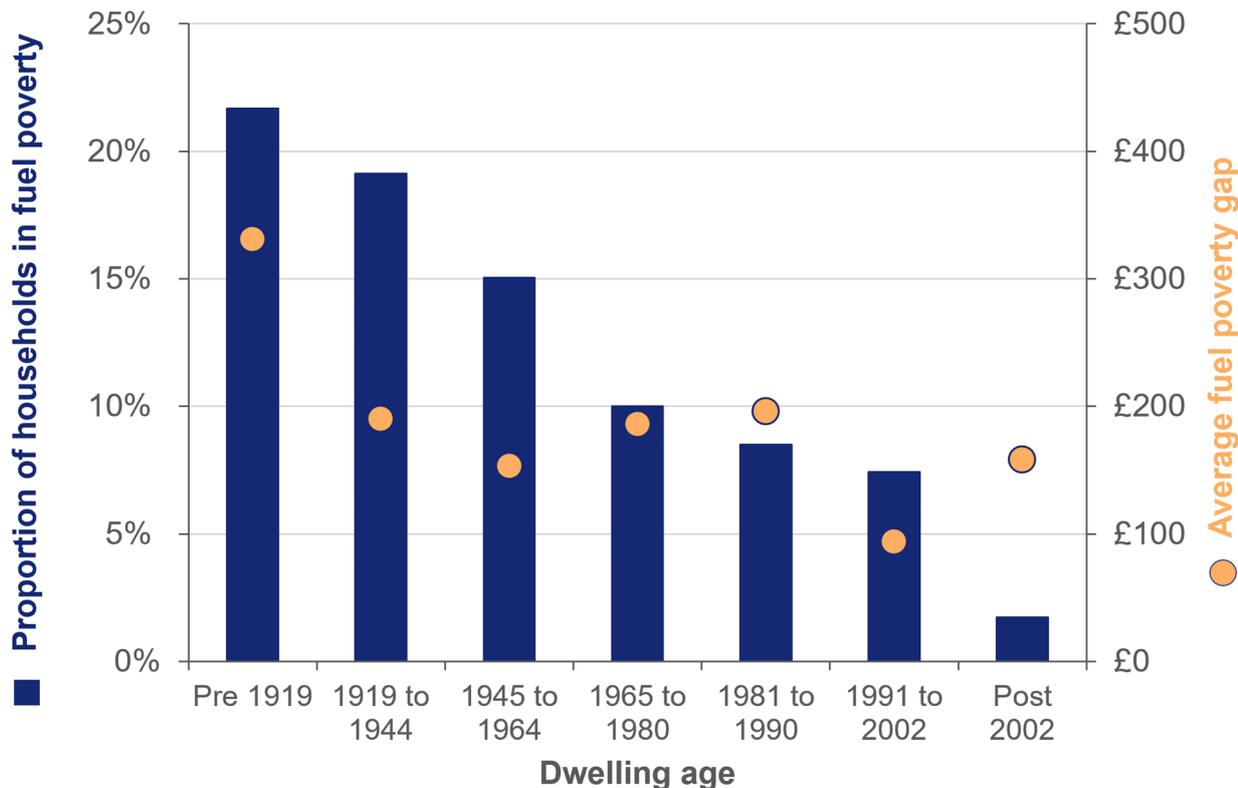


There is a higher proportion of fuel poor households among households living in smaller homes due to a lower median income of £18,769 compared to a median of £25,707. In general, larger floor areas correlate with higher incomes but lower energy efficiency resulting in higher fuel costs (see Supplementary Table 8).

While the share of fuel poor households is lowest in homes with floor areas of 110m² or more at 9.5 per cent, they have the highest fuel poverty gap of £351. This is due to higher median fuel costs of £1,544 in these larger homes compared to £1,223 overall.

3.1.5 Property age

Figure 3.8: Households living in properties built before 1919 have the highest share of fuel poverty and highest average gap at £331, more than three times the average gap properties built after 1991 in 2020²⁷



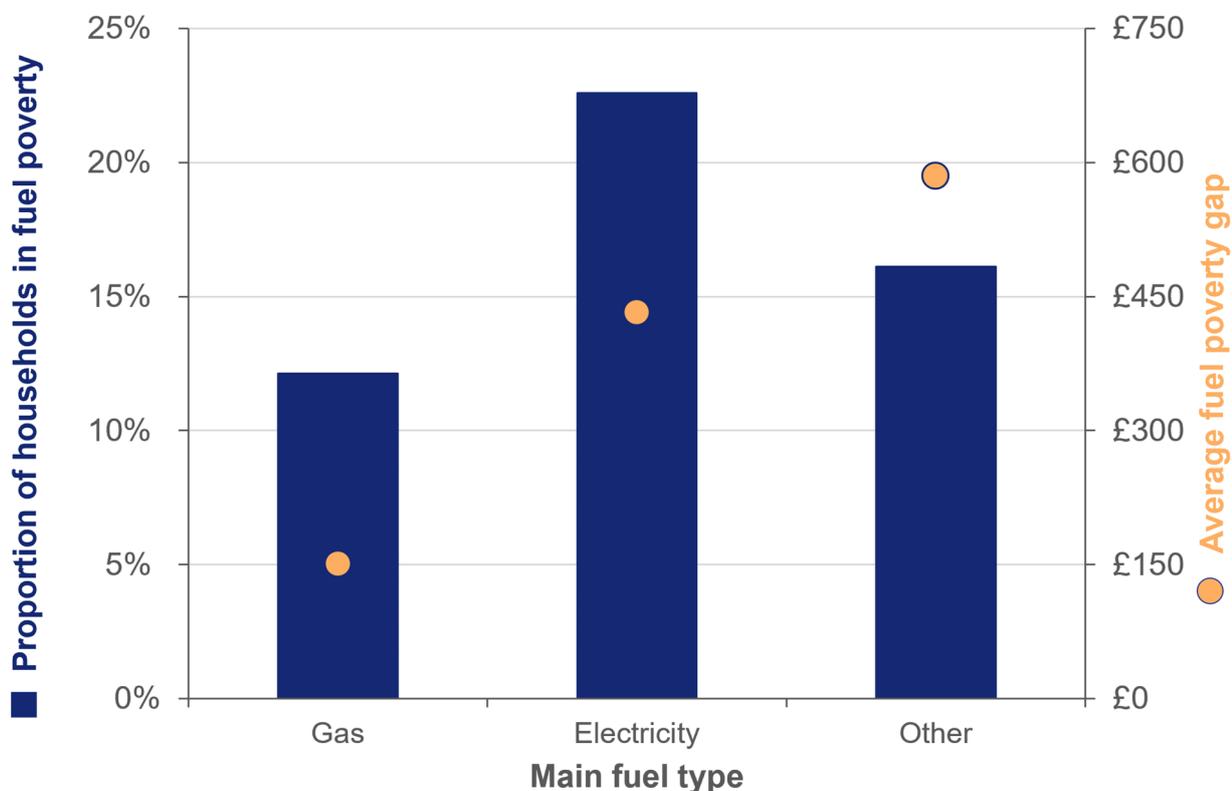
Households living in properties built before 1919 have the highest average gap at £331 and the largest proportion in fuel poverty (21.7 per cent). This is due to their lower than average energy efficiency rating and higher than average floor area leading to a higher than average fuel cost for older homes compared with newer ones (see Supplementary Table 7). This trend broadly correlates to the decreasing average fuel poverty gap in more recently built properties as energy efficiency broadly improves with decreasing property age.

Building regulations have driven up energy efficiency standards with households living in homes built after 2002 having a median energy efficiency rating of 78 (high band C) compared with 62 (mid band D) for homes built pre 1919 and the overall median of 68 (high band D).

²⁷ 'Post 2002' figures for fuel poor households are based on low sample count (between 10 and less than 30), inferences should not be made based on this figure.

3.1.6 Main fuel type

Figure 3.9: In 2020 households using electricity as their main fuel for heating had the highest likelihood of being in fuel poverty but those using non gas/electric heating have the highest fuel poverty gap



Households using electricity as a main fuel for heating had the highest likelihood of fuel poverty at 22.6 per cent, compared to gas at 12.1 per cent. This is due to the higher fuel expenditure associated with properties with a lower energy efficiency but also the lower median incomes of these households (See supplementary table 10). Households using gas as their main fuel had a median energy efficiency rating of 69 compared with 62 for those using electricity and 58 for those using other fuels.

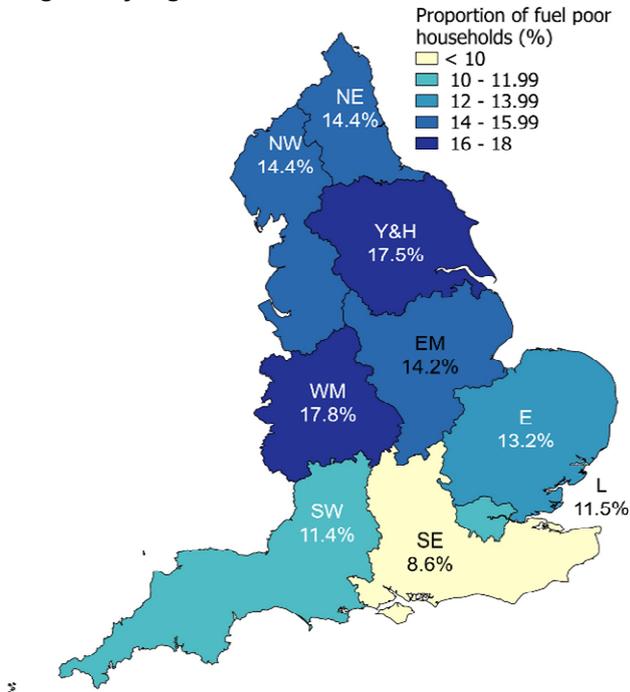
Households using electricity and other fuels have a lower than average energy efficiency rating (62 and 58 respectively). The median fuel cost for a household using electric heating is the highest at £1,534, due to the higher cost of electricity despite having the smallest median floor area of 58m², compared to 83m² overall. The 'other' category which consists predominantly of oil or coal²⁸, has the highest average gap at £585. Those using electricity as a main fuel for heating make up 8 per cent of households in England in comparison to 85 per cent using mains gas, however they account for 14 per cent of all fuel poor households.

²⁸ Other includes heating oil, anthracite nuts, household coal, smokeless fuel, wood, propane, bulk LPG, community heating from boilers/CHP/ waste heat.

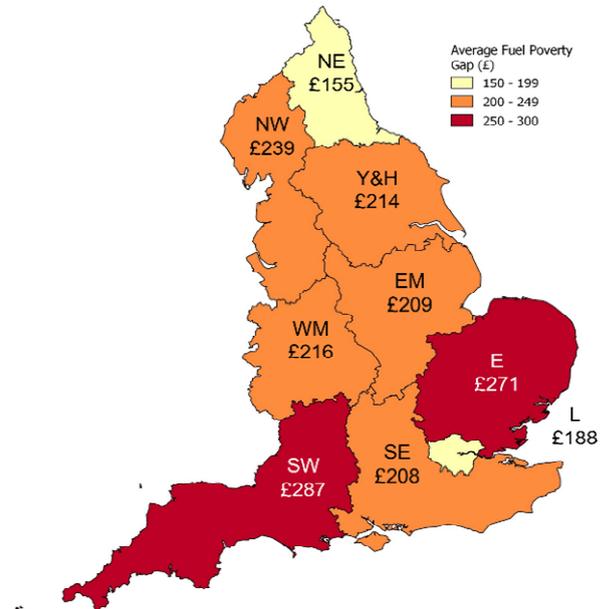
3.1.7 Region

Figure 3.10: In 2020, households living in the West Midlands had the highest proportion of fuel poor households and the South West had the highest average gap

The proportion of poor households across England by region



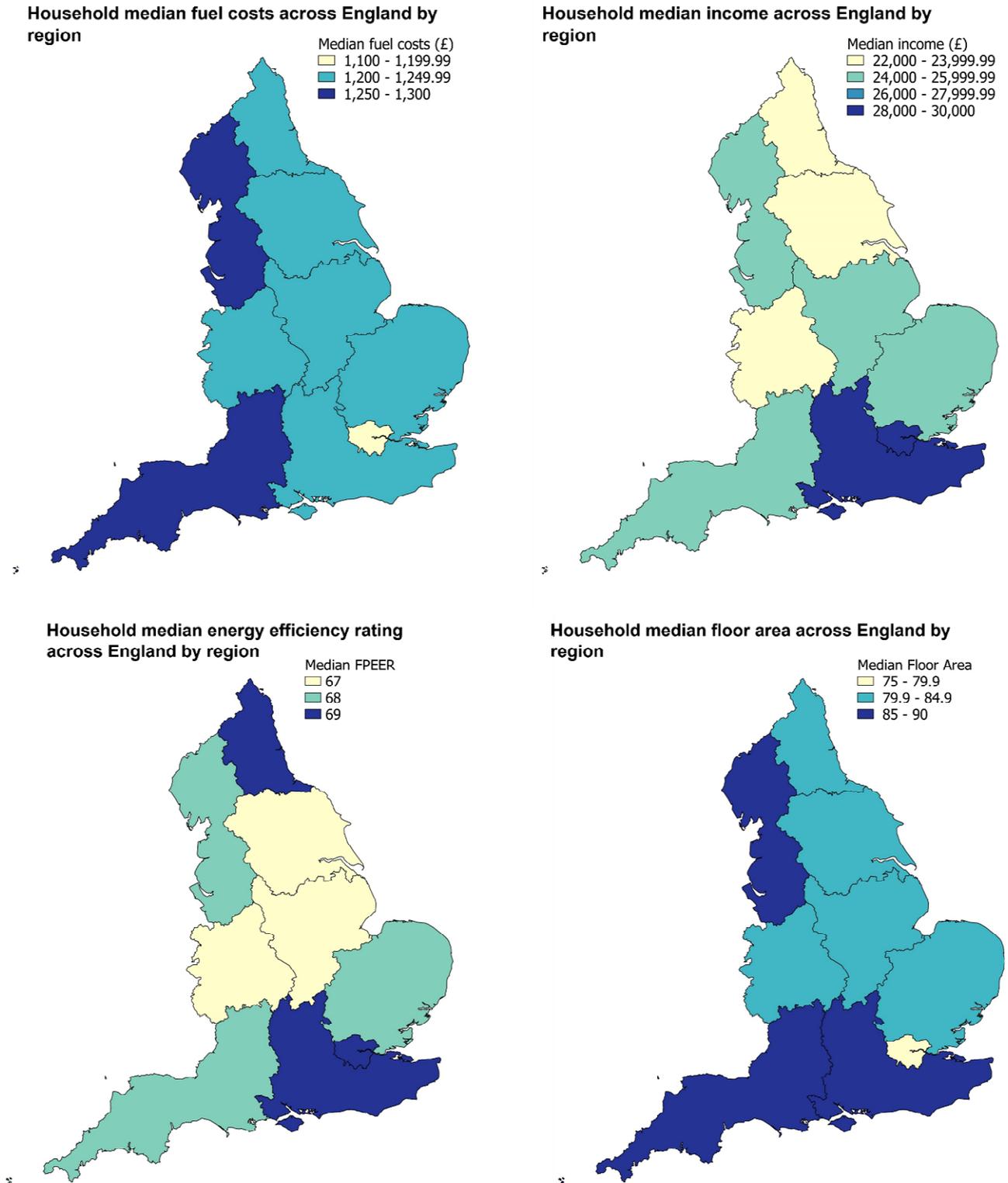
The average fuel poverty gap across England by region



There is a high level of variation in fuel poverty rates between regions. The West Midlands had the highest rate of fuel poverty at 17.8 per cent, compared to 8.6 per cent in the South East. Given there were similar median energy efficiency ratings between regions and similar median fuel costs, the lower median incomes seen in northern regions and West Midlands have driven the higher shares of fuel poverty.

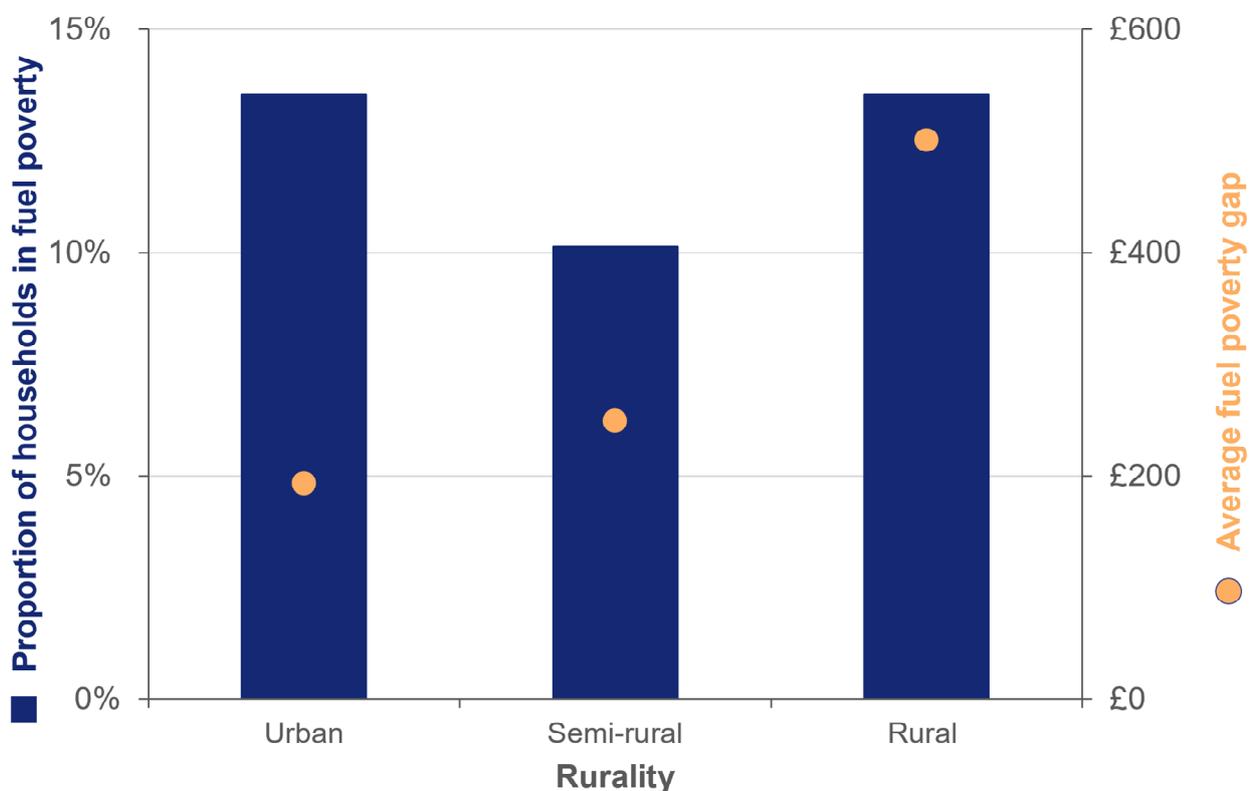
The South West had the second highest median floor area (86m²) which drives the highest median fuel costs (£1,274) and hence the highest average fuel poverty gap of £287. London has shown a strong reduction in fuel poverty in 2020 having seen an increase of 21 per cent in median income since 2019 and a 20 per cent increase in its share of band A-C rated homes. This has led to a reduction in the rate of fuel poverty from 15.2 per cent in 2019 to 11.5 per cent in 2020. Over the same period the average fuel poverty gap increased from £178 to £188 in real terms. This result is very different from previous years, and may be due to issues with this year's sample as discussed in Annex B of this report.

Figure 3.11: Northern regions tend to have lower than average (median) incomes, whilst southern regions outside London tend to have the largest median floor areas



3.1.8 Rurality and gas grid connection

Figure 3.12: In 2020, households living in urban and rural areas have the same rates of fuel poverty but rural households have a much larger fuel poverty gap



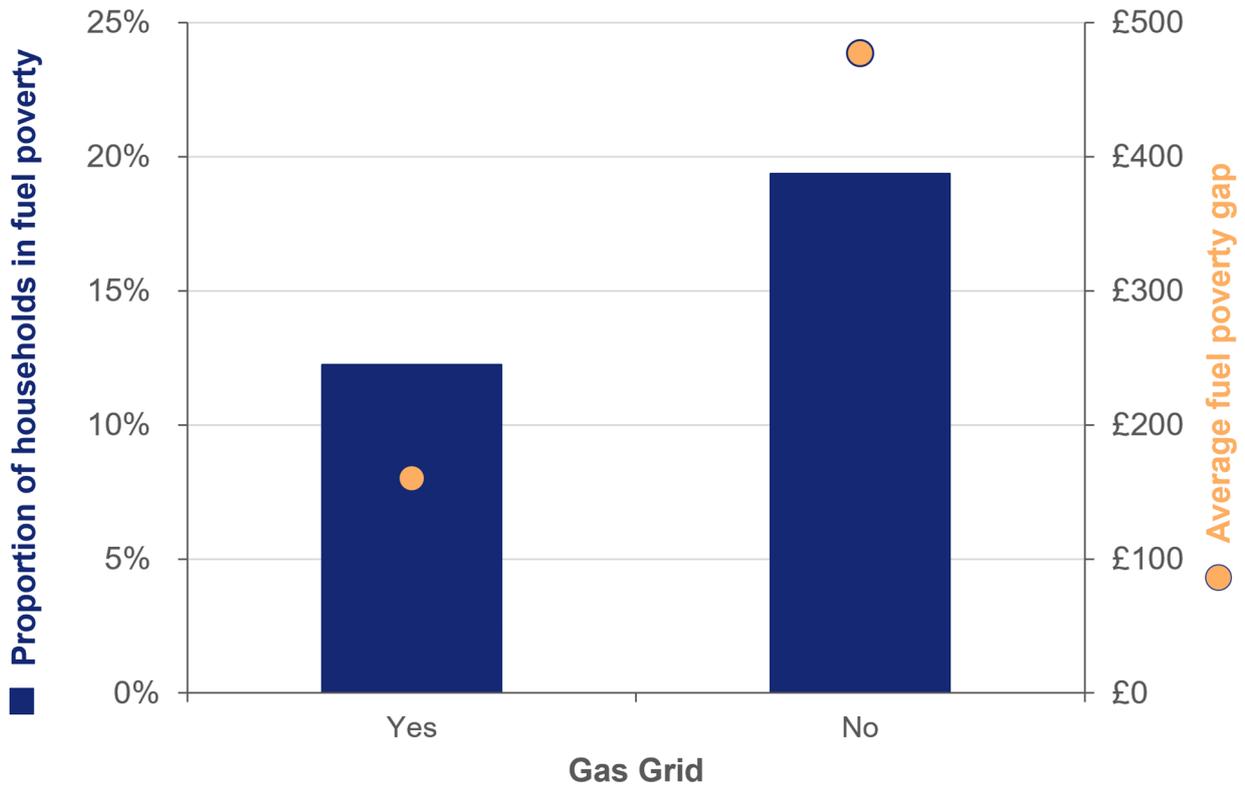
Urban (82% of households) Semi-Rural(9%) Rural (9%)

Households living in urban and rural areas both have a fuel poverty rate of 13.5 per cent but rural households have the largest fuel poverty gap at £501. Households in semi-rural areas had a lower fuel poverty rate of 10.1 per cent.

Households living in rural areas are, on average, in much less energy efficient and much larger properties but have higher than average median incomes (see Supplementary Table 4). Rural properties have a higher incidence of being off the gas grid – the survey showed 52.6 per cent are off gas grid, compared to just 9.8 per cent of urban properties.

Of households living in properties not on the gas grid, 19.4 per cent are fuel poor compared to 12.3 per cent on the gas grid. These compare with 22.9 per cent and 22.0 per cent respectively in 2010, showing the reduction in fuel poverty has largely come from households connected to the gas grid where 50.1 per cent of homes are band A-C compared with 33.3 per cent for off gas grid homes. The average fuel poverty gap for households off the gas grid was £477, three times higher than on gas grid households (£160).

Figure 3.13: Fuel poor households are more likely to be off the gas grid and have an average fuel poverty gap three times higher than gas households

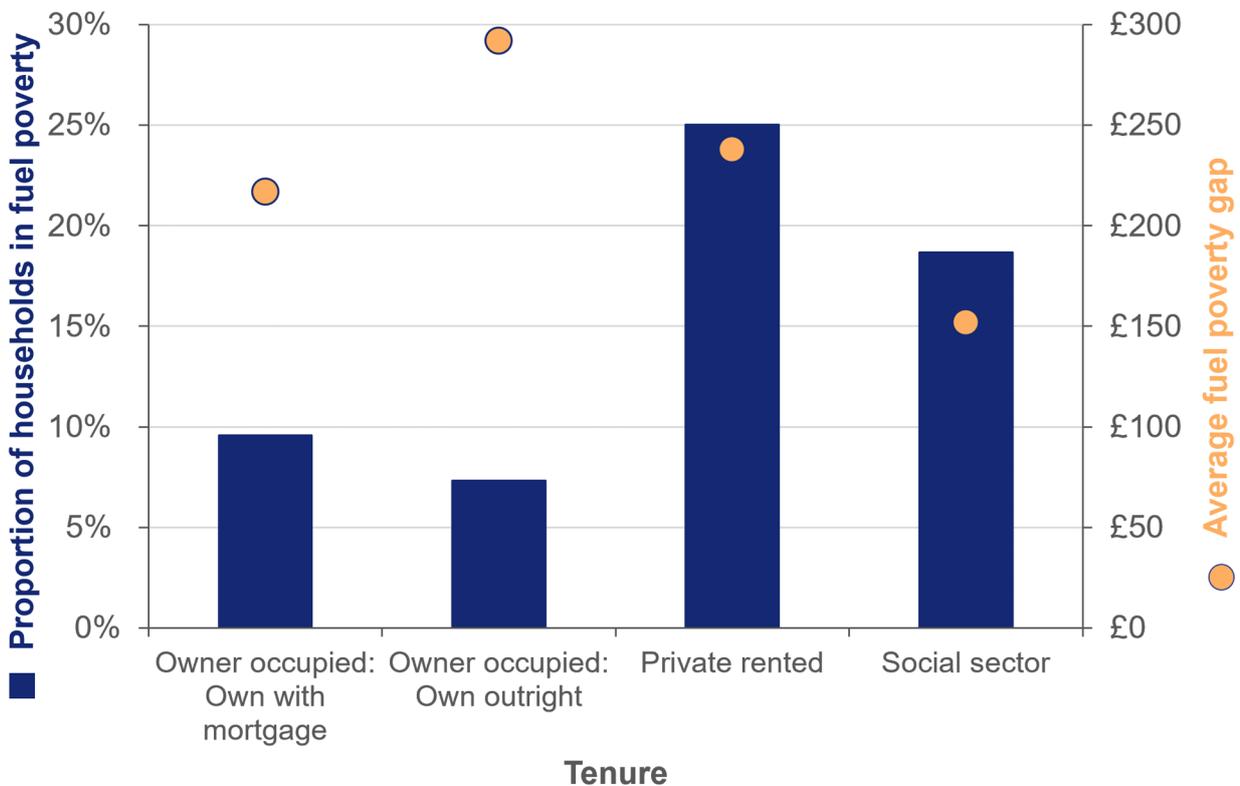


3.2 Household characteristics

3.2.1 Tenure

The differences in fuel poverty prevalence and the average gap by tenure reflect both the nature of the housing stock and household characteristics typical to a household's tenure.

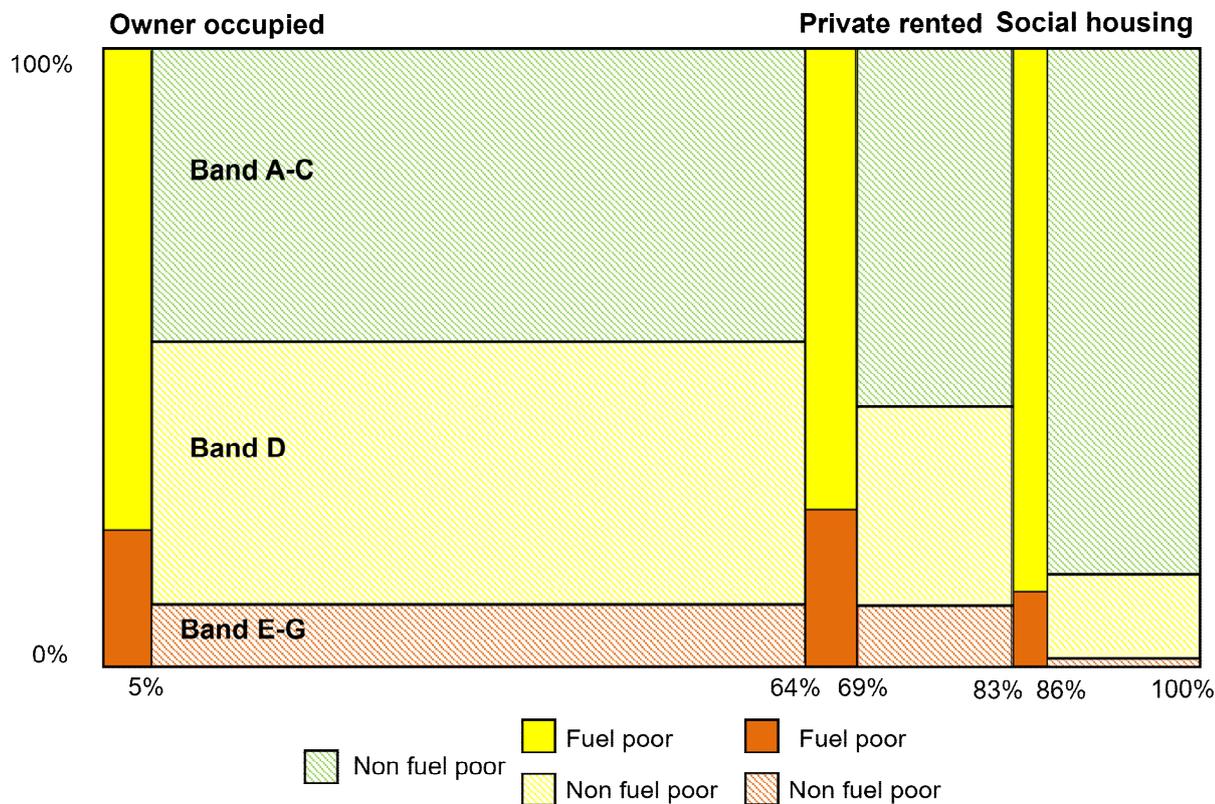
Figure 3.14: The proportion of households in fuel poverty was highest for private renters at 25.0 per cent whilst owner occupiers (outright owners) have the highest average gap at £292



The highest level of fuel poverty was in the private rented sector with 25.0 per cent of these households being fuel poor.

Owner occupiers had the lowest level of fuel poverty reflecting their higher median incomes. Owner occupiers who own their home outright are slightly less likely to be fuel poor (7.3 per cent) than those with a mortgage (9.6 per cent). This is partly due to their minimal housing costs.

Figure 3.15: There is a higher proportion of band A, B and C properties that are socially rented compared to owner occupied and privately rented properties.



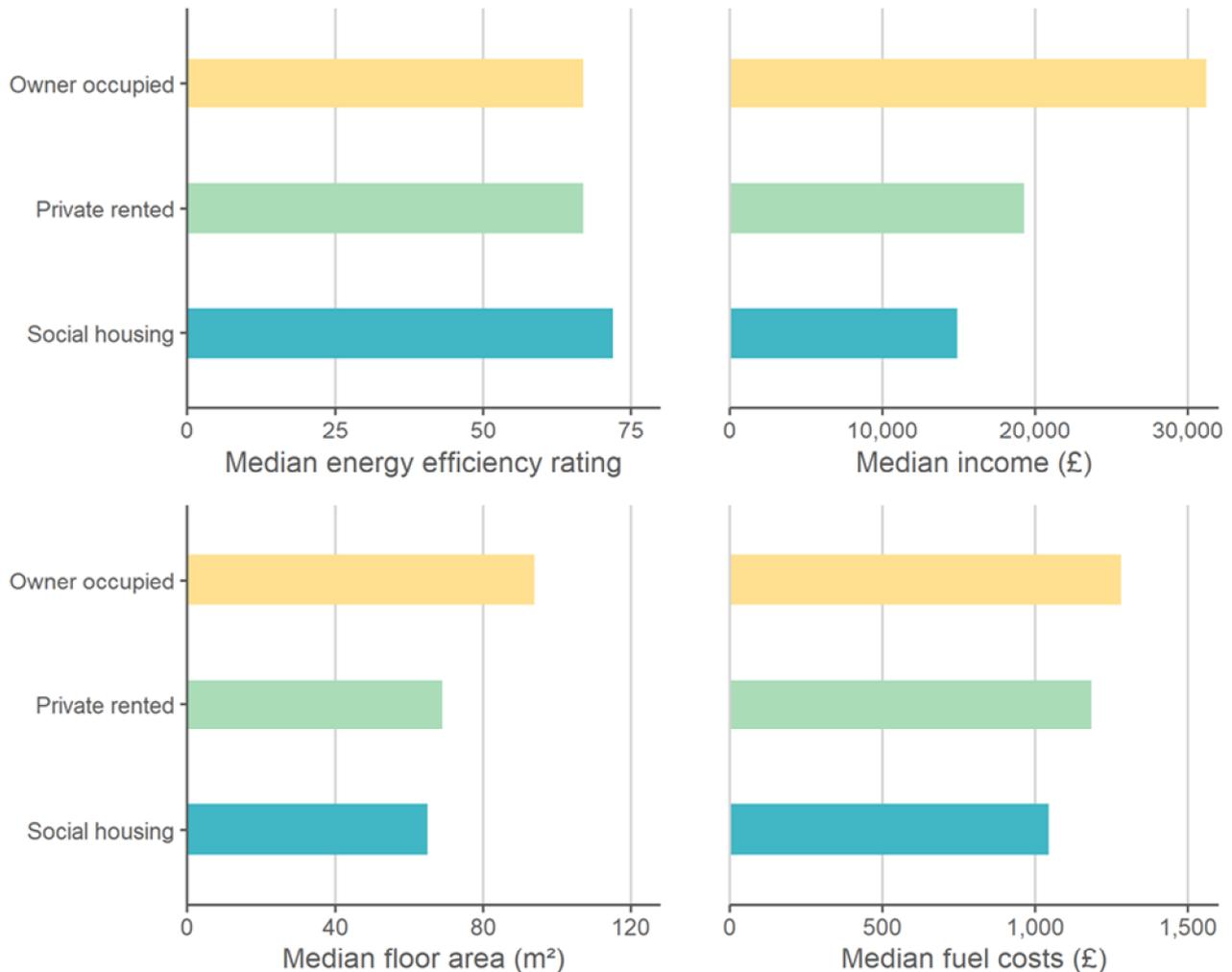
Area is equivalent to the proportion of households in that group.

By definition, any household with an energy efficiency rating of A-C is not fuel poor regardless of income. The highest share of band A-C homes is in the social housing sector where 69.3 per cent of homes were band A-C in 2020. Of households with band D-G rating in this tenure, 60.9 per cent were fuel poor. While the median income of households living in social housing was 22.7 per cent lower than for private rented households, the higher levels of energy efficiency have driven down the rate of fuel poverty from 40.3 per cent in 2010 to 18.7 per cent in 2020.

In the private rented sector, the share of band A-C homes has increased from 29.3 per cent in 2017 to 43.6 per cent in 2020 which the Private Rented Sector regulations will have helped drive. The sector still has the highest fuel poverty rate based on the lower income households who live in this sector compared with the owner-occupied sector.

Overall 40.8 per cent of fuel poor households are owner occupied, 35.4 per cent are privately rented and 23.8 per cent live in social housing. As a comparison, 64.4 per cent of all households are owner occupied, 18.7 per cent privately rented and 16.8 per cent live in social housing.

Figure 3.16: Social housing properties tend to be more energy efficient driving lower levels of fuel poverty despite having the lowest median incomes

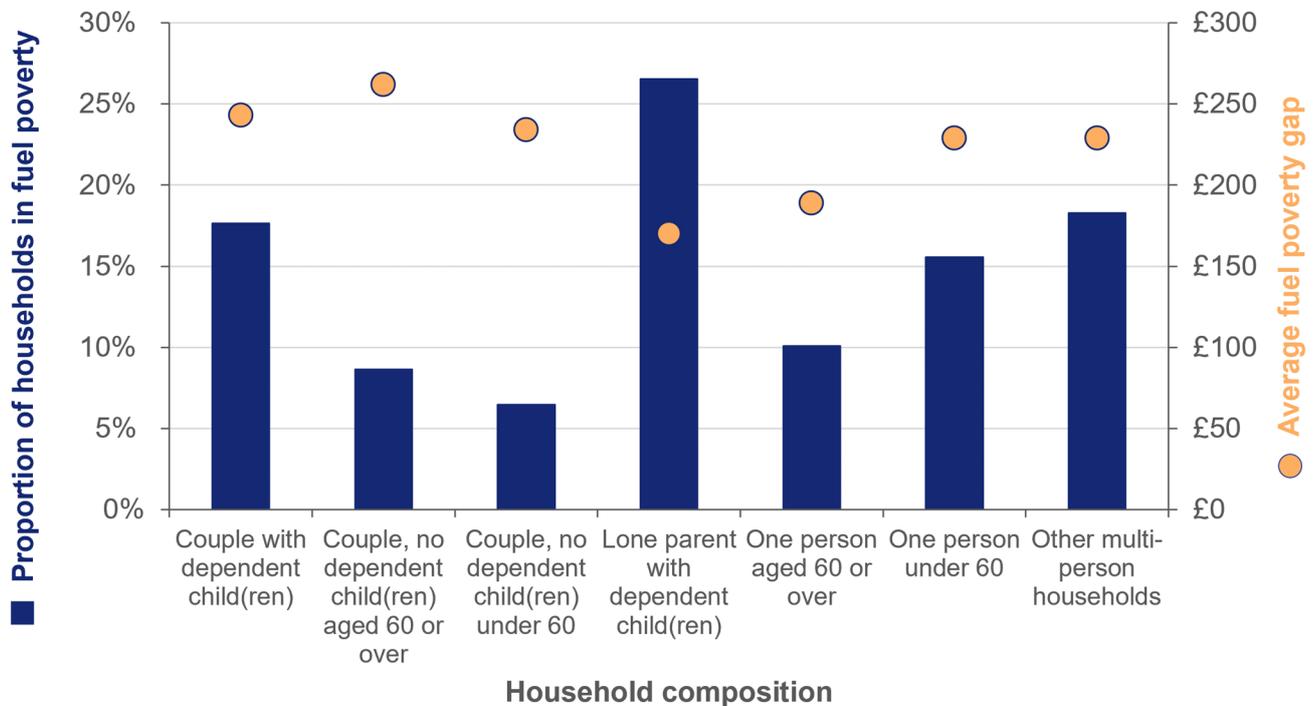


As seen in Figure 3.16 social housing properties tend to be more energy efficient with 69.3 per cent of social rented homes now rated C or above and as such are not fuel poor. Of social rented homes below band C, 60.9 per cent were fuel poor due to the lower incomes in this tenure.

Owner occupied and privately rented properties have lower median energy efficient ratings resulting in higher energy costs and a higher average gap. The median income of owner occupiers is significantly larger than that of private renters and social renters leading to a lower rate of fuel poverty within this tenure.

3.2.2 Household composition

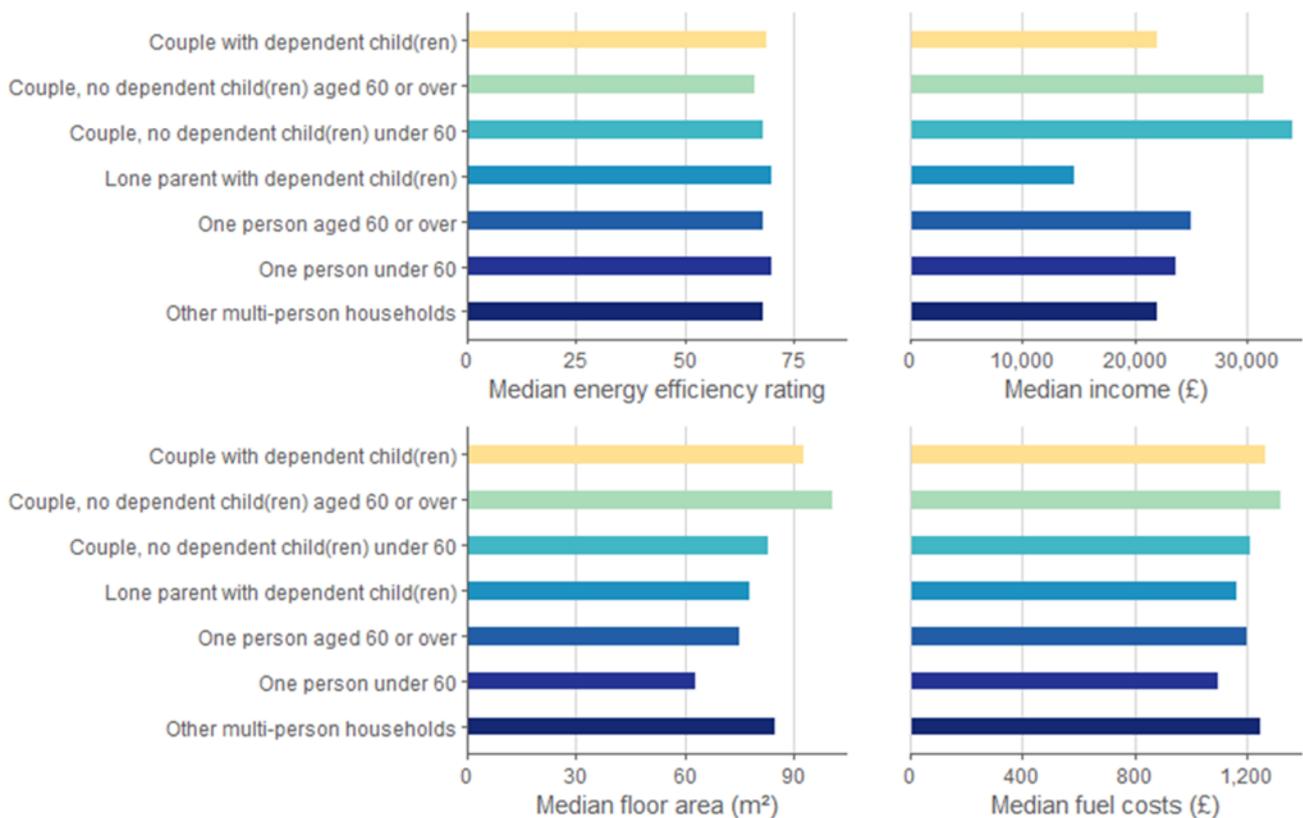
Figure 3.17: Single parents have the highest proportion of households in fuel poverty and couples aged over 60 have the highest average gap



Single parent households have consistently had the highest proportion of households in fuel poverty (see Trends Table 11). In 2020, 26.5 per cent of single parent households were fuel poor likely due to their considerably lower median income but the lowest average fuel gap of £170 due to a high energy efficiency rating.

Couples over 60, had the highest average gap (£262) whilst having a lower prevalence of fuel poverty (8.7 per cent), this is likely due to their larger median floor area and higher median fuel costs. Couples under 60 without children were the least likely to be in fuel poverty (6.5 per cent) with an average gap of £234 likely due to their high median income.

Figure 3.18: Single parent households have considerably lower median income than average



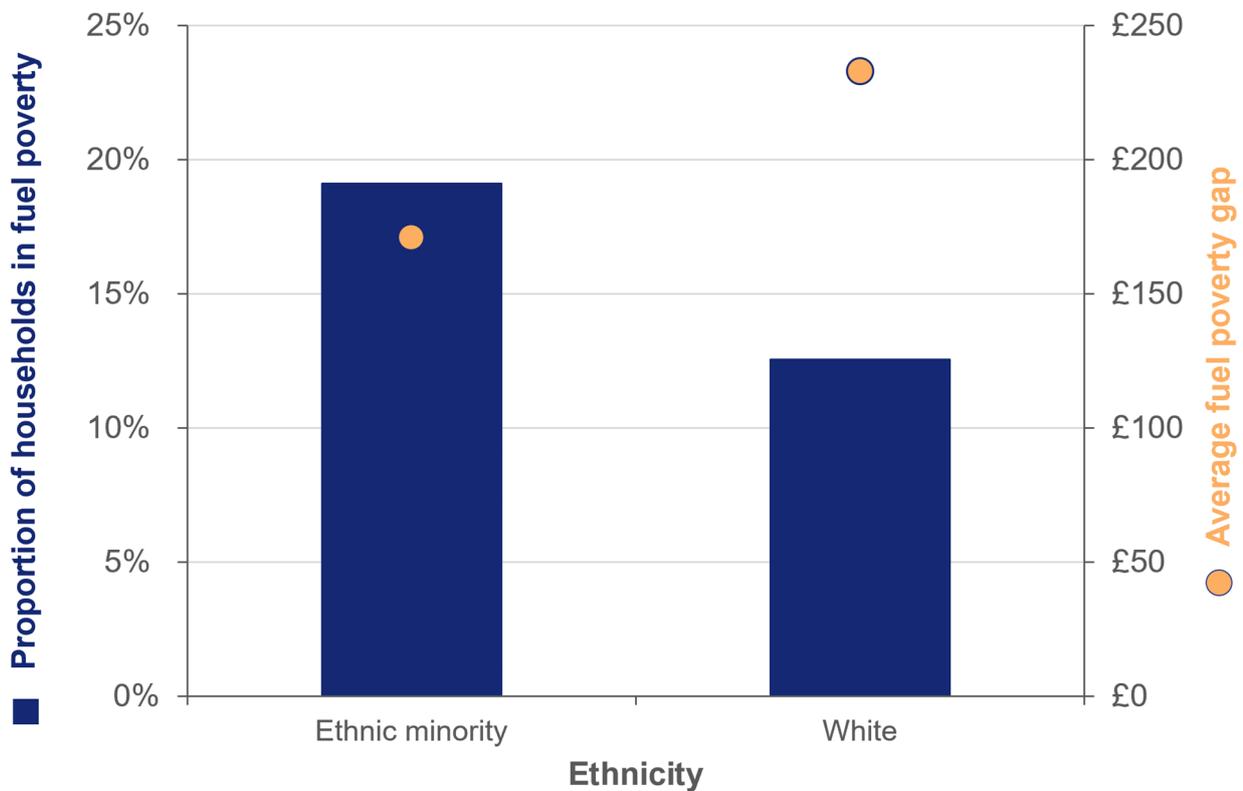
In 2020, 40.3 per cent of all fuel poor households had one or more dependent children (1.3 million households). This is 5.3 per cent of all households and 20.0 per cent of all households with children.

3.2.3 Ethnicity

Households are classified based on the ethnicity of the household reference person (HRP)²⁹. Some households will contain members from more than one ethnic group, which is not reflected in this analysis.

²⁹ The person in whose name the dwelling is owned or rented or who is otherwise responsible for the accommodation. In the case of joint owners and tenants, the person with the highest income is taken as the HRP. Where incomes are equal, the older is taken as the HRP.

Figure 3.19: Households with an ethnic minority HRP are 50 per cent more likely to be in fuel poverty but a lower average gap than households with a white HRP



Households with an ethnic minority HRP had a higher proportion of households in fuel poverty at 19.1 per cent compared with 12.6 per cent for households with a white HRP. Households with a white HRP had a higher average fuel poverty gap of £223 compared with £171 for ethnic minorities.

In 2020, the median income for ethnic minority households was, on average, lower than the income for white households which partly explains their higher likelihood of fuel poverty³⁰. However, ethnic minority households tend to have a higher proportion living in social housing (26.8 per cent compared to 15.6 per cent for white households) and tend to live in more energy efficient properties with a median energy efficiency rating of 70 compared to 68 for white households which may explain their lower average gap.

This data is also published as part of the [Ethnicity Facts and Figures collection](#) published by the Cabinet Office.

³⁰ See Table 16 in the [supplementary tables](#).

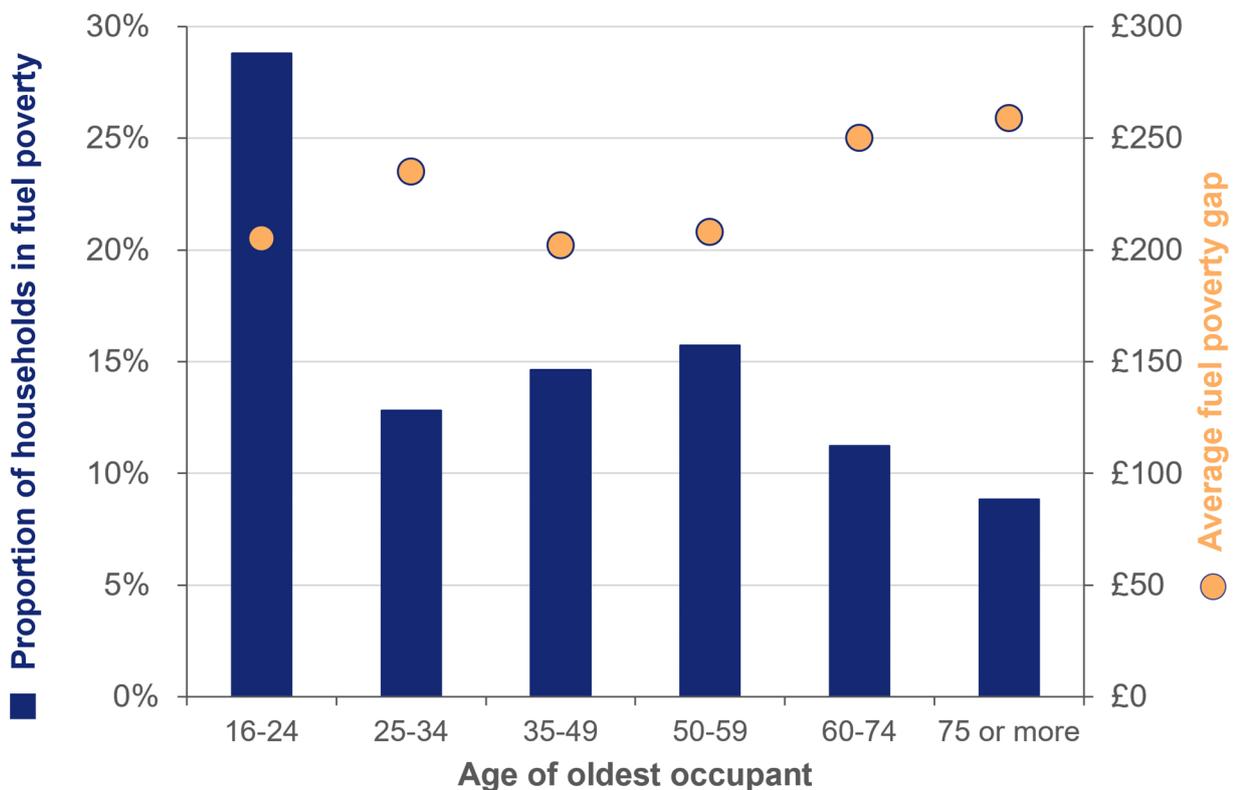
3.2.4 Age

Age can be analysed in two different ways:

- Age of the oldest member of the household.
- Age of the youngest member of the household.

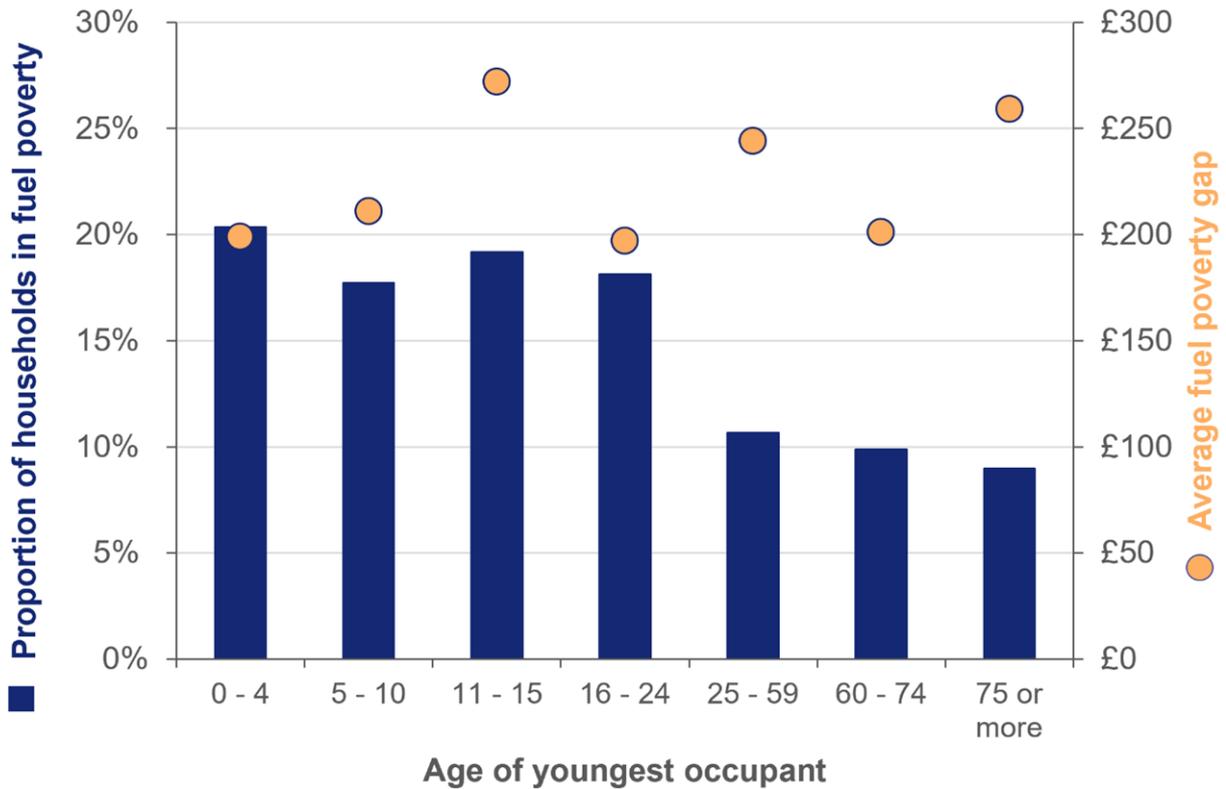
This allows us to distinguish between households with young children and households that comprise solely of those aged 75 and over.

Figure 3.20: Households where the age of the oldest member is between 16 and 24 have the highest likelihood of being in fuel poverty (28.8 per cent), with an average gap of £205



In 2020, 28.8 per cent of households where the oldest member is aged 16 to 24 years were fuel poor, which is likely to be a result of lower incomes for younger households. The youngest households (age 16-24) had a median income of £15,195 compared to £25,707 for all households (See Supplementary table 15).

Figure 3.21: Households including children and young people have the highest likelihood of being in fuel poverty



Households with children and people aged 24 or under had the highest prevalence of fuel poverty. This is due to these households having lower than average equivalised median income. Equivalised income reflect the number of people in the household who depend on the total household income. The lowest median income was for households with a child aged 0-4, and 5-10 of £18,280 and £19,894 respectively compared with an overall median income of £25,707.

3.3 Household income

3.3.1 Employment status

Data are based on the household reference person (HRP). Many households will contain members with a mixture of employment statuses, which is not reflected in this analysis.

Figure 3.22: Households with an unemployed HRP or one in full time education have the largest proportion of households in fuel poverty while households with a HRP in full time work have the lowest³¹

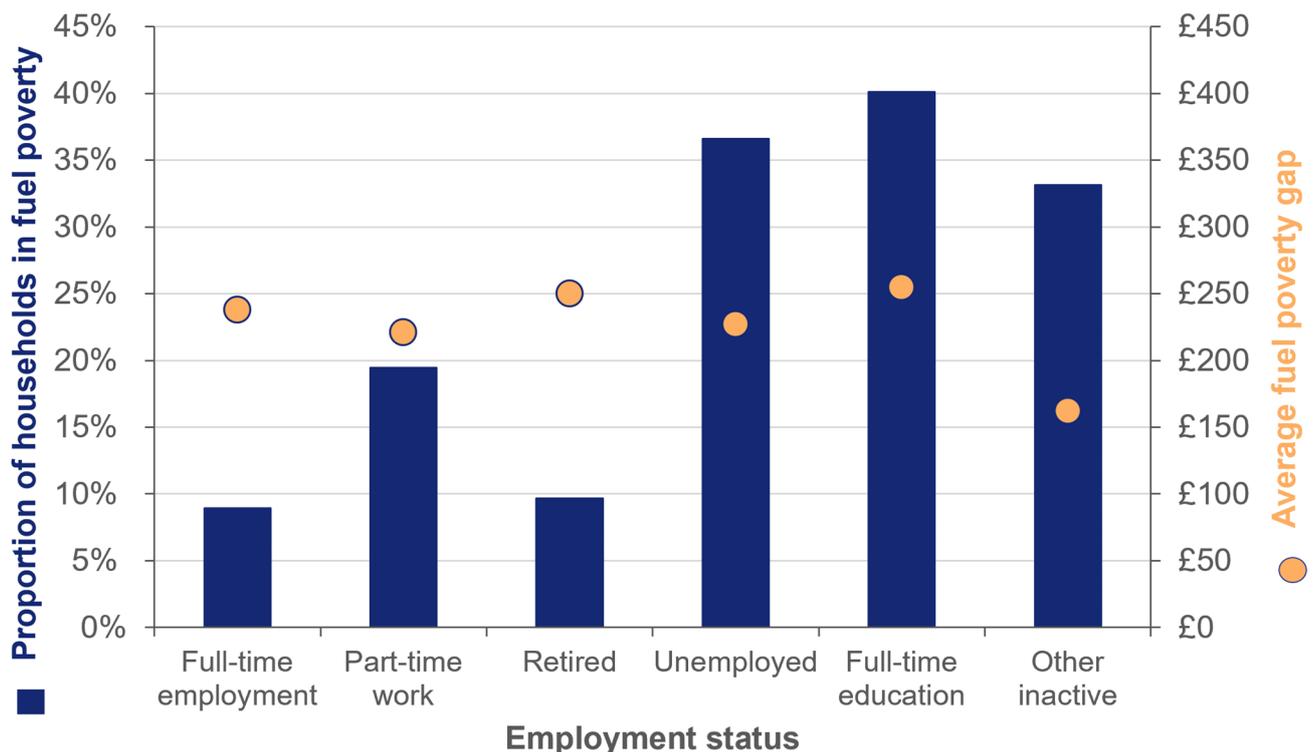
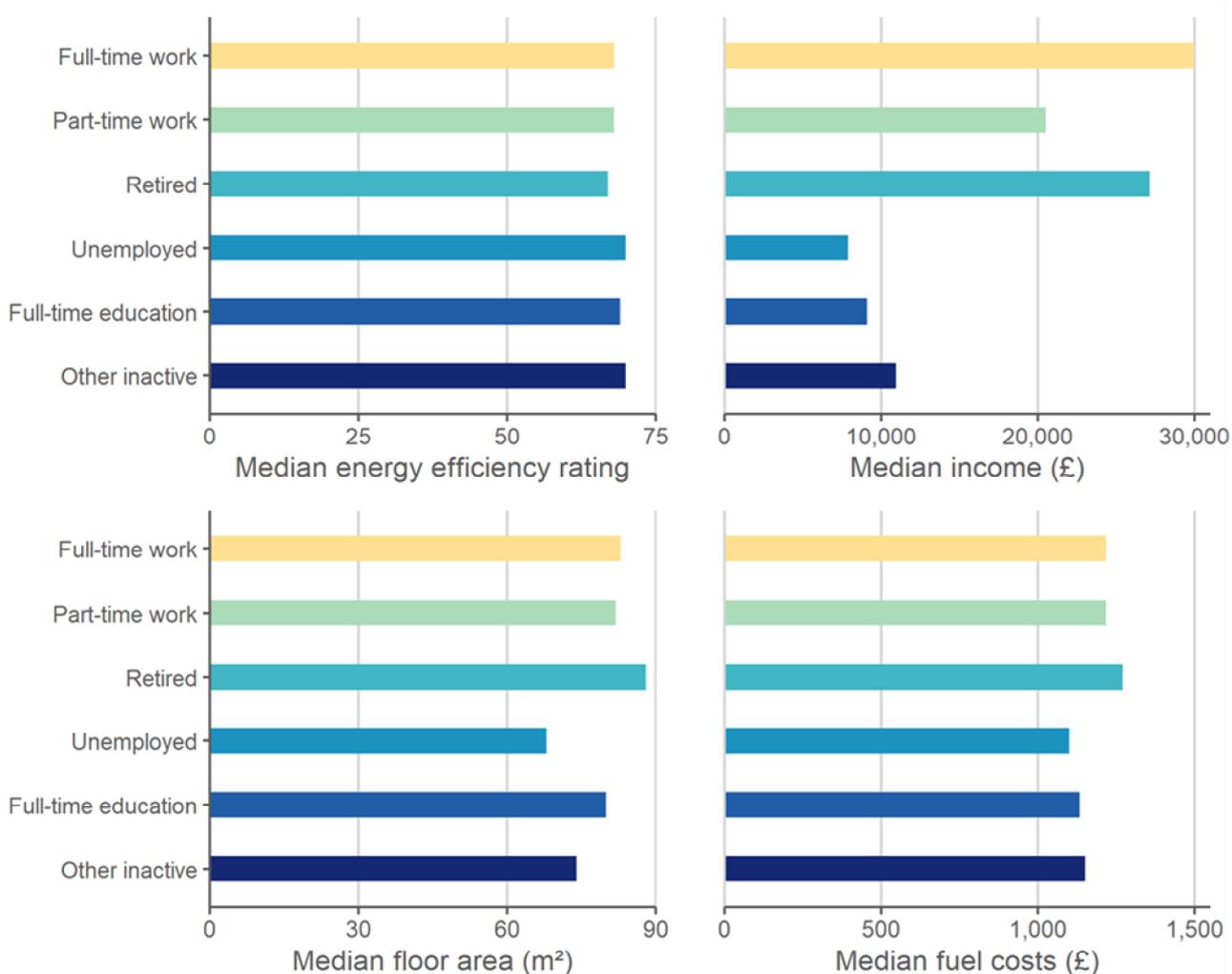


Figure 3.22 shows that those in full-time work and retired have the lowest proportions that are classed as fuel poor (8.9 per cent and 9.7 per cent, respectively). Whereas households where the HRP is a full-time student (40.1 per cent) or unemployed (36.6 per cent) have the highest likelihoods of being in fuel poverty.

Despite having a lower level of fuel poverty, retired households have the highest fuel poverty gap of £250 other than those in full time education reflecting their higher median fuel costs (£1,270) due to slightly higher floor areas, slightly lower energy efficiency and reporting that they are more likely to be at home during the day on weekdays, although it is noted the differences in daytime occupancy between different employment statuses was less significant in 2020/21.

³¹ Figures for households where the HRP is in full time education are based on small sample sizes, inferences should not be made based on this figure

Figure 3.23: Households where the HRP is unemployed have the lowest median income and the lowest median fuel costs



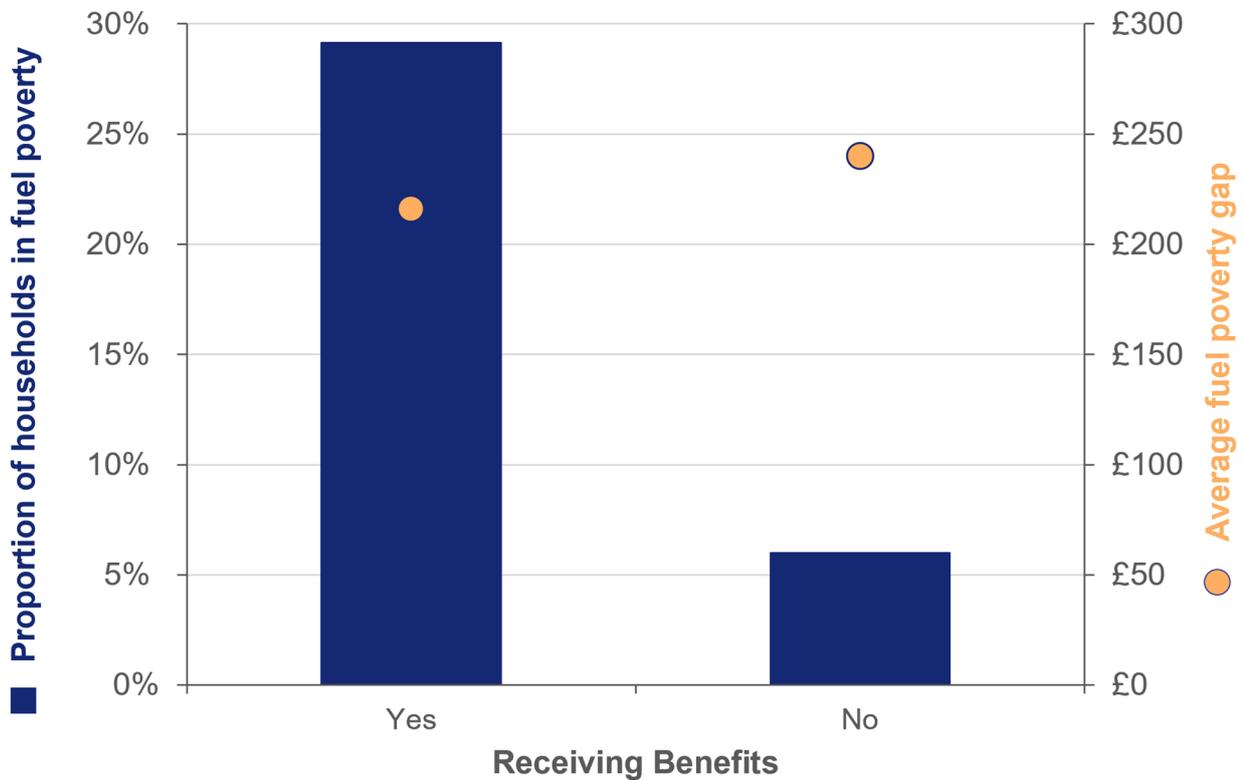
The median income for households tends to be negatively correlated with the proportion of households in fuel poverty. For example, households where the HRP is in full time work have the lowest proportion in fuel poverty (8.9 per cent) and the highest median income of £29,952.

3.3.2 Benefits

To better understand the interaction of fuel poor households and household supported with benefits additional tables have been included this year using an alternative methodology to more fully identify households in receipt of benefits. A summary of these changes is described in Annex E. It is proposed to only publish the tables on the new methodology in future.

Given that income from disability benefits (Attendance Allowance, Disability Living Allowance and Personal Independence Payments) are not included in the fuel poverty income, the analysis below does not count households as receiving benefits unless they received another benefit in addition to a disability benefit.

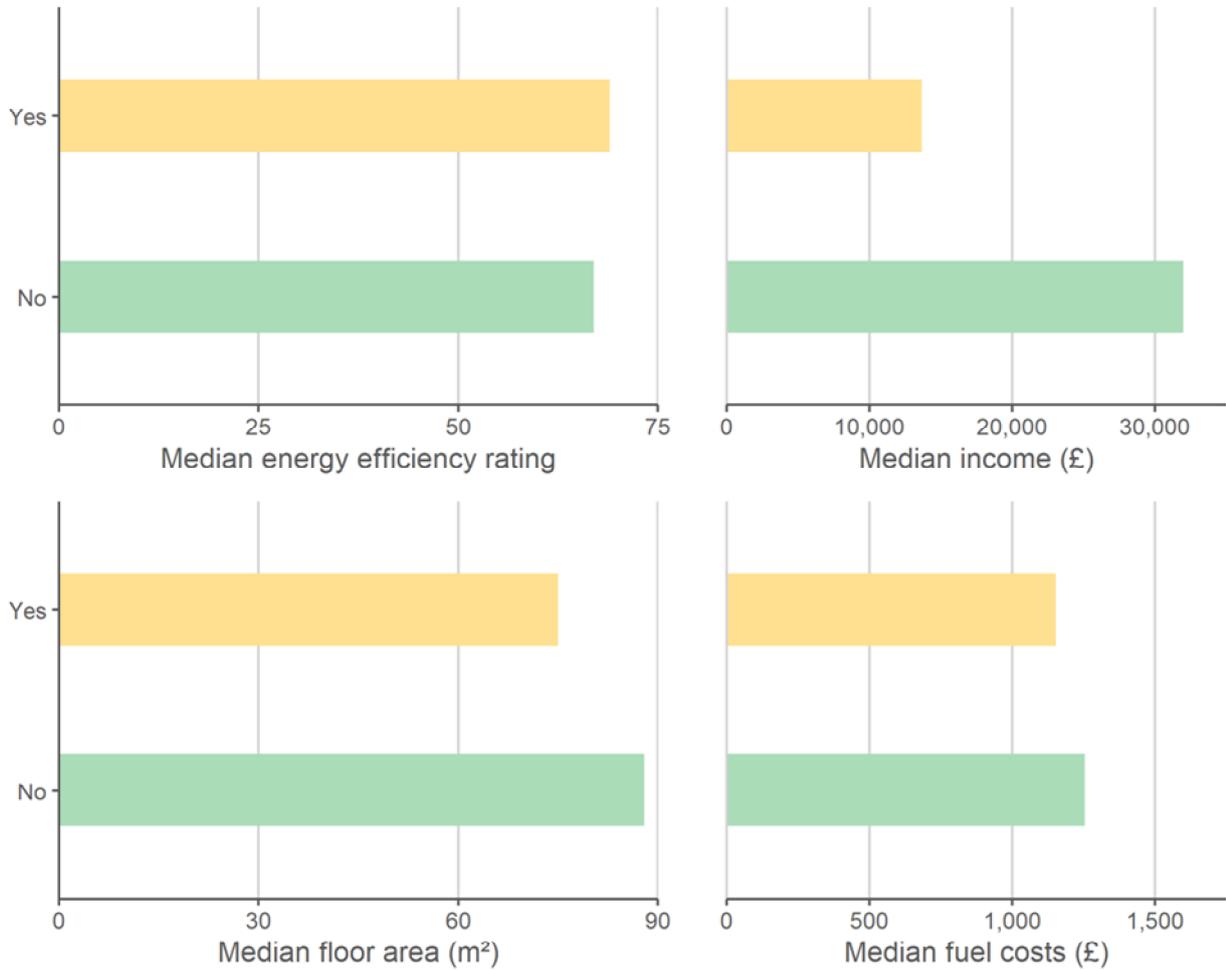
Figure 3.24: In 2020, 29 per cent of households in receipt of benefits were fuel poor compared with 6 per cent not in receipt of benefits supporting low income households³²



Overall an estimated 68.8 per cent of households in fuel poverty are receiving at least one of these benefits (Table 34a). This share rises to 75.4 per cent if disability benefits are included (Table 34b).

³² Income Support, Universal credit, Jobseeker’s allowance, Employment and support allowance, Pension credit, Housing benefits, Local housing allowance, Council tax benefit, Child tax credit & Working tax credit. It does not include households receiving other state benefits e.g. State pension or Child benefit which are not specifically for low income households.

Figure 3.25 Households in receipt of benefits had much lower incomes than other households but also higher energy efficiency ratings and smaller floor areas leading to lower median fuel costs than other households.

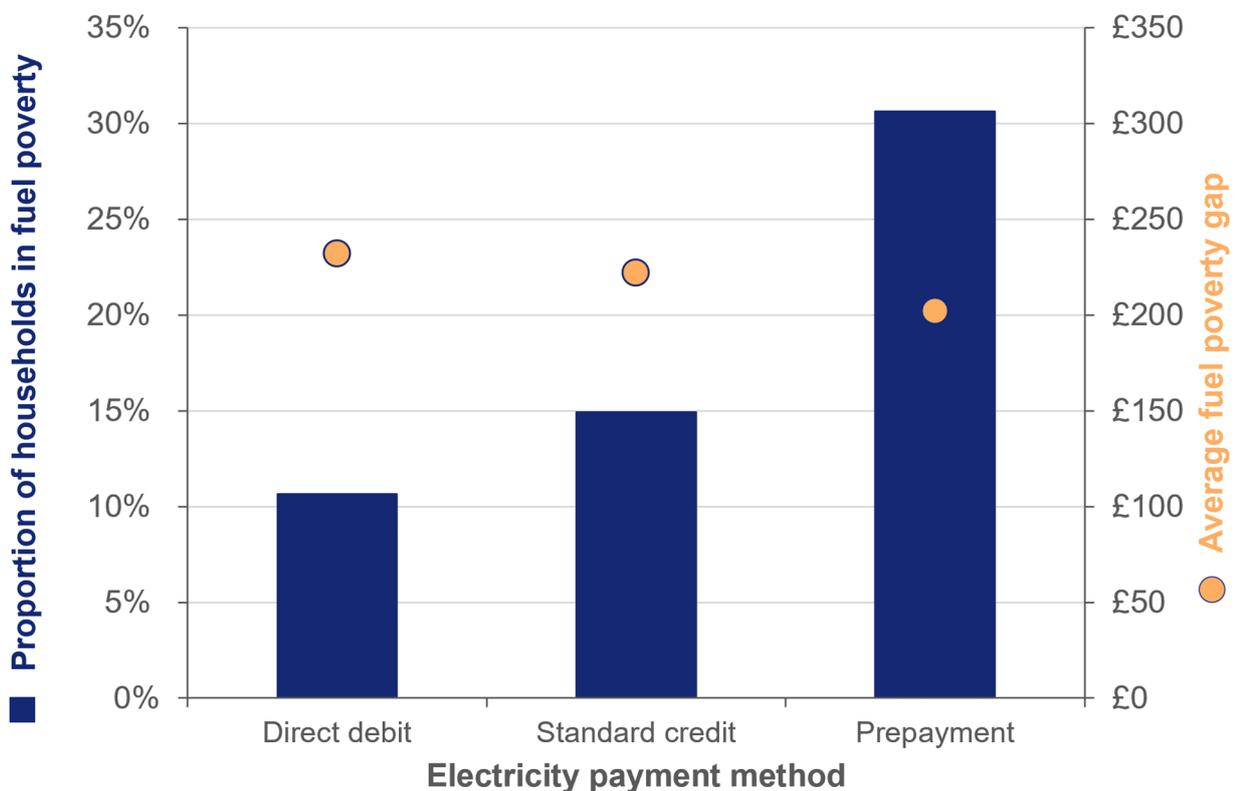


3.4 Fuel payment type

Households that pay by prepayment meter have historically had the highest likelihood of fuel poverty of the payment types. It should be noted that under the LILEE metric this is driven by the lower incomes associated with households with these tariffs rather than the tariff itself. It is noted though that the fuel poverty gap for these households is affected by tariffs which is seen in figure 3.26.

3.4.1 Electricity payment method

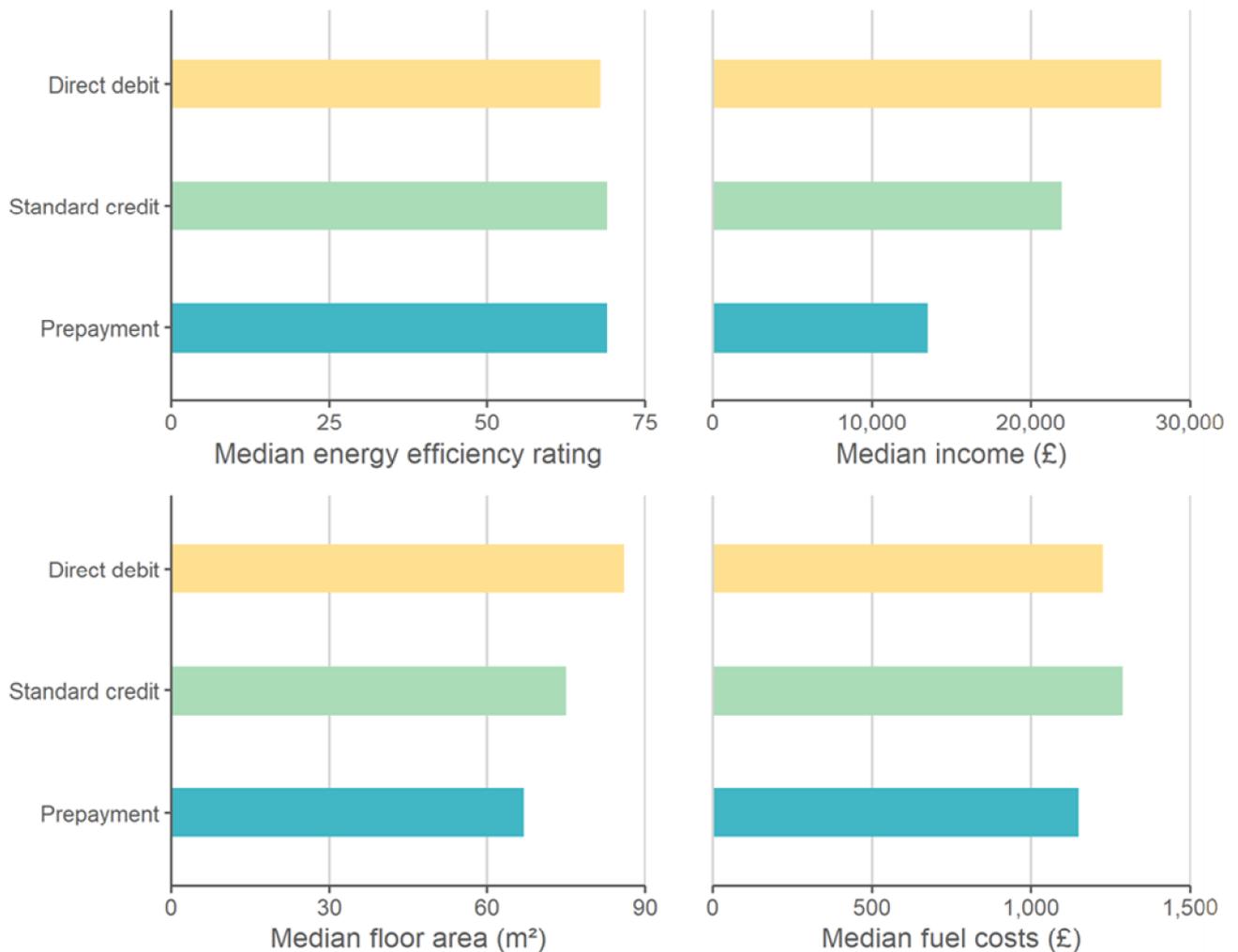
Figure 3.26: Households that pay for their electricity by prepayment have the highest proportion in fuel poverty but the lowest fuel poverty gap



The share of households in fuel poverty using a pre-payment electricity meter is 30.6 per cent compared with 10.7 per cent for direct debit. Households with pre-payment electricity meters had the lowest median income of £13,512, driving high levels of fuel poverty, but the lowest median floor area of 67m² and the lowest fuel costs of £1,150 which contribute to this payment method having the lowest fuel poverty gap of £202.

The average fuel poverty gap fell by 7.7 per cent for direct debit customers and fell by 8.2 per cent for standard credit in real terms between 2019 and 2020 partially reflecting lower real prices for these tariffs but the average gap rose by 15.1 per cent for those on prepayment meters.

Figure 3.27: Households that pay for electricity by prepayment meter tend to live in smaller properties, have lower than average median fuel costs and a much lower median income



The proportion of households in fuel poverty and the average gap follows a similar pattern for a household’s gas method of payment as it did for electricity method of payment.

As presented in this chapter and summarised in Chapter 2, the prevalence of fuel poverty in England varies by several key dwelling and household characteristics.

More detailed information can be found online in the accompanying [detailed, trends and supplementary tables](#) for fuel poverty in England.

Chapter 4: Projected Fuel Poverty Figures

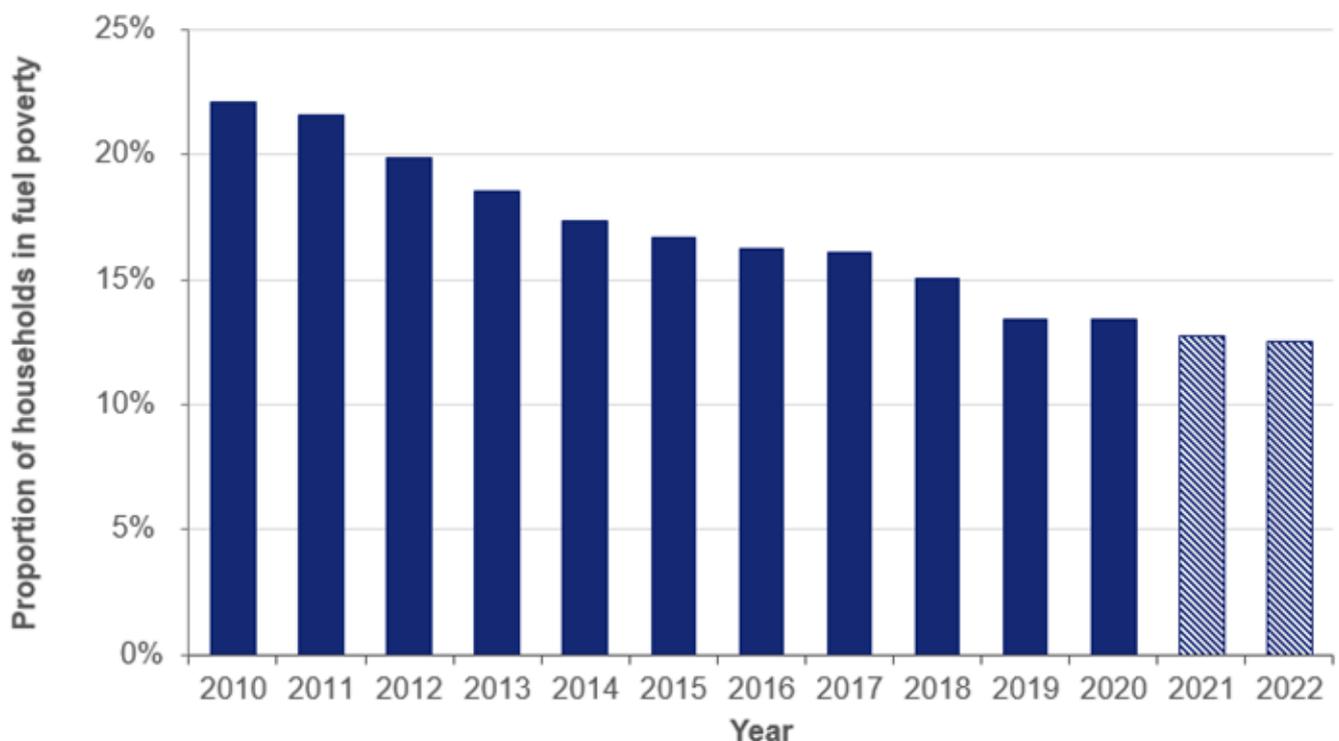
4.1 Projected headline figures, 2020-2022

Table 4.1: Projected headline figures, 2020-2022³³

Headline figures	2020 Outturn	2021 Projection	2022 Projection
Average fuel poverty gap (£)	223	233	258
Aggregate fuel poverty gap (£ millions)	705	713	779
Proportion of households in fuel poverty (%)	13.2	12.8	12.5
Number of households in fuel poverty (millions)	3.16	3.06	3.03

Note that these figures are based on our fuel poverty projections model. These should be interpreted as indicative projections, not precise point estimates.

Figure 4.1: The proportion of households in fuel poverty is projected to continue to decrease to 2022 driven by energy efficiency progress

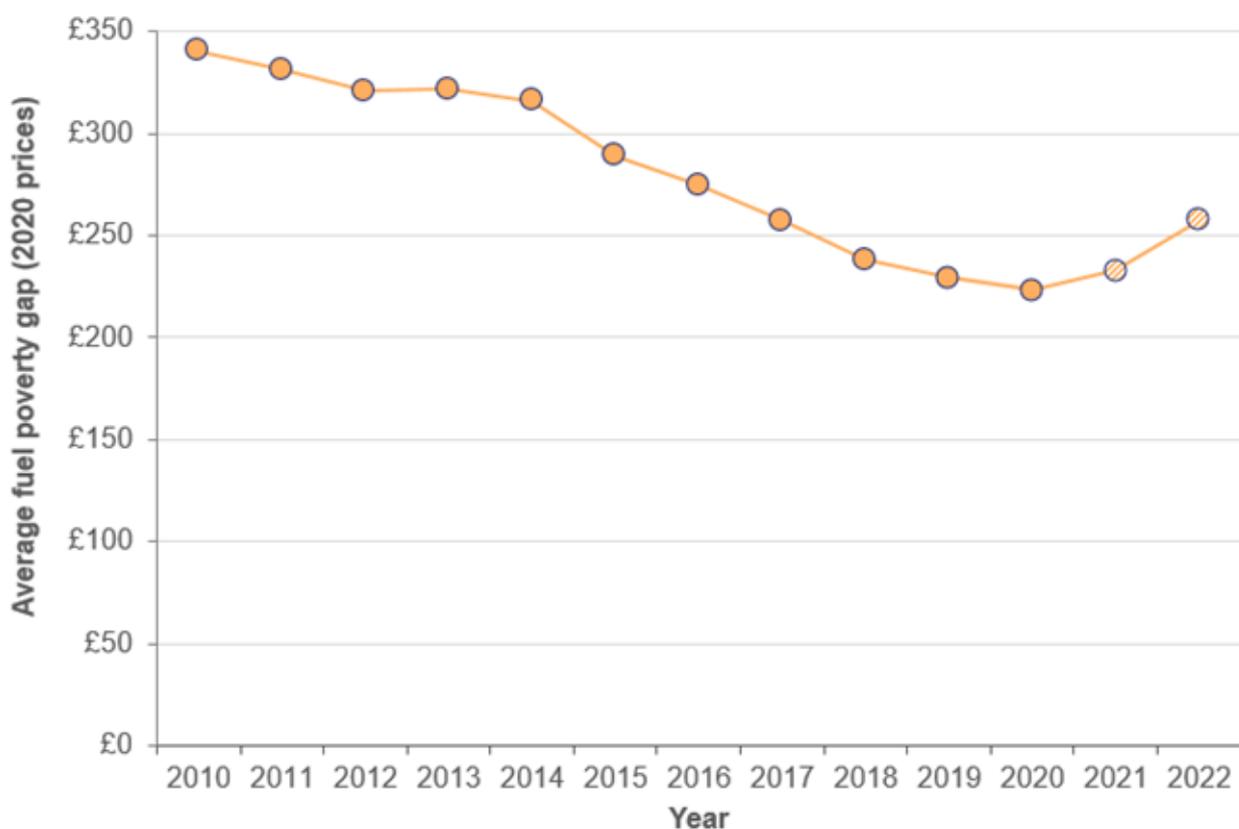


³³ The fuel poverty gap figures are adjusted to 2020 prices.

The proportion of households in fuel poverty fell steadily from 22.1 per cent in 2010 to 13.2 per cent in 2020 and is projected to fall further to 12.5 per cent in 2022. This is mainly due to continued progress in energy efficiency. It is noted that the rate of decrease in fuel poverty has slowed as a result of changes in incomes in 2020 and 2021, due to the impact of the pandemic and higher prices in 2022.

The average fuel poverty gap for England in 2022 (the reduction in fuel costs needed for a household to not be in fuel poverty) is projected to be £258, up by 15 per cent in real terms since 2020 (£223). The fuel poverty gap is directly affected by changes in price since it measures the reduction in fuel costs needed for a household to not be in fuel poverty.

Figure 4.2: The average fuel poverty gap is projected to increase after 2020 due to projected increases in real terms energy prices



The aggregate fuel poverty gap for England is projected to be £779 million in 2022 an increase of 10.5 per cent in real terms since 2020 (£705 million). This growth reflects the higher average gap due to projected higher energy bill costs.

The estimates presented above are based on projecting forward from two years of survey data and so the year on year trend does not present the full impact of changes affecting single years. For example, in 2022/23 prices are expected to rise by 54 per cent but only half of this impact will be seen in the estimates for 2022.

4.2 Changes to key drivers, 2020-2022

The key drivers will be assessed in turn, to explore their effect on the 2020 based projections. **Higher** incomes, **increased** energy efficiency and **lower** energy prices would each have a positive impact on a fuel poor household. More information on key drivers can be found in Section 2.3.

While the fuel poverty indicator has an absolute threshold for energy efficiency, the relative nature of the income threshold makes it difficult to accurately isolate individual reasons for change.

A household's fuel poverty status depends on the interaction of three key drivers

- **Energy efficiency** – improvement in energy efficiency between 2020 and 2022.
- **Incomes** – the recovery phase of the Covid 19 pandemic has a slight impact on these projections mostly due to income changes, which are expected to grow slightly faster in low income deciles than the median as the economy recovers.
- **Energy prices** – the default tariff price cap announced for summer 2022 resulted in higher energy prices in real terms, which is projected to increase the fuel poverty rate slightly and a substantial increase in the average fuel poverty gap. The 2022 projection includes the impact of a support package for energy bills announced in February 2022.

To help users understand the impact of each of these drivers a decomposition of the main changes for the 2021 and 2022 projections is shown. Table 4.2 shows the headline estimates of fuel poverty and Table 4.3 the estimates of the fuel poverty gap as these changes are modelled in sequence.

- Scenario 1 – Changes since 2020 due to **energy efficiency measures** and housing stock change³⁴.
- Scenario 2 – Changes since 2020 due to **income and housing costs** plus scenario 1 impact.
- Scenario 3 - Changes since 2020 due to **prices** plus scenario 2 impacts.
- Scenario 4 – Changes to all impacts including new support for household bills through the Government's [energy bills rebate](#)³⁵.

³⁴ The increase in housing stock improves energy efficiency since new build homes are assumed to be band A-C.

³⁵ Council tax is modelled in the fuel poverty calculation as a housing cost but given its one-off impact has been modelled in scenario 4 but not in scenario 2.

Table 4.2 Projected share of fuel poor households by scenario

Scenario	2021 Projection	2022 Projection
1 (energy efficiency)	12.9%	12.5%
2 (energy efficiency + income)	12.7%	12.3%
3 (energy efficiency + income + price)	12.8%	12.9%
4 (full impact)	N/A	12.5%

Table 4.3 Projected average fuel poverty gap by scenario (real 2020 prices)

Scenario	2021 Projection	2022 Projection
1 (energy efficiency)	£225	£221
2 (energy efficiency + income)	£227	£221
3 (energy efficiency + income + price)	£233	£272
4 (full impact)	N/A	£258

The figures for scenario 1 in 2022 show that as a result of energy efficiency improvement in the housing stock the rate of fuel poverty would fall from 13.2 per cent in 2020 to 12.5 per cent. A slight change in the income distribution further reduces this to 12.3 per cent. Once the increase in energy prices is included, this increases to 12.9 per cent before falling to 12.5 per cent after including the expansion of Warm Home Discount and the support package announced by the Government.

Overall, the average fuel poverty gap has increased from £223 in 2020 to £258 in 2022 in real terms.

4.2.1 Energy efficiency

Fuel poverty under LILEE has shown a strong declining trend driven by energy efficiency, as more low income households achieve an energy efficiency rating of C or above.

Currently, the main policies under which energy efficiency measures are installed include:

Policy	Incentive	Type of measure covered
Energy Company Obligation (ECO) ³⁶	Households eligible for ECO can get a grant to cover, or contribute to the costs of, home energy efficiency improvement.	Replacement boiler, heating improvements, insulation, double glazing, additional innovative measures .
Green Homes Grant (GHG)	Households applied for vouchers to fund measures. The scheme covered both low-income households and other households. There is also a Local Authority Delivery element to this scheme.	A range of insulation measures, low carbon heating and heating controls.
Warm Homes Discount (WHD) ³⁷	Annual rebate for electricity bills for low income and vulnerable households. For the purposes of fuel poverty modelling this provides an uplift to the FPEER rating.	£140 rebate off electricity bills in 2021/22. The rebate will increase to £150 for 2022/23 and be offered to an increased number of eligible households.
Energy bills rebate	This includes a one-off repayable discount to energy bills for all households in 2022 and an additional council tax rebate to all Council taxpayers in England in bands A to D.	All domestic electricity customers will get £200 off their energy bills from October 2022, with 80 per cent of households receiving a £150 Council Tax rebate from April 2022.

The overall trend in the increase of condensing boilers (including condensing-combination boilers) in England is projected to continue. Around 400,000 additional condensing boilers (excluding new builds) are added to the stock of homes, between 2020 and 2022. The model has been developed to account for the high number of condensing boilers that already exist in the housing stock and as such are removed as these are already captured through the policies listed above, or as a result of the new dwellings modelled.

In 2021, Warm Home Discount (WHD) rebate was provided automatically to over one million households in receipt of Pension Credit Guarantee Credit (PCGC). In addition, over 1 million rebates were provided to customers who applied via their energy supplier; these are usually families on working age benefits.

In 2022 the Government is planning to reform the WHD scheme, increasing the overall size, and introducing a high energy cost element to the working age eligibility criteria. Data would be

³⁶ From October 2018, the ECO scheme was wholly targeted to low income vulnerable households. In previous phases of the ECO scheme, any household was entitled to subsidies towards energy efficiency improvements, regardless of their income. [ECO statistics](#).

³⁷ The Warm Home Discount (WHD) will be [better targeted for 2022](#). A Government response has not yet been published but the Chancellor confirmed the main points on 3 February 2022.

provided to energy suppliers, enabling them to issue rebates to eligible customers automatically. The scheme for the PCGC group would remain the same as in 2021. The fuel poverty projections modelling has been based on this consultation.

4.2.2 Income

A key component of this year's projections has been to understand the changes in incomes as the economy recovers from the pandemic.

The components that comprise a household's full income³⁸ (after income tax and National Insurance contributions) are categorised as follows:

- Earnings
- Savings
- Benefits
- Other
- Winter fuel payments
- Council tax

Strong income growth is projected across the income distribution. As described in the Methodology Handbook, different sources are used for projecting earnings and other income sources some of which can be projected separately across the deciles. In addition, the share of each income source within deciles and the amount of housing costs affect the overall change in income within a decile. Also, the £150 council tax rebate has uplifted the AHC income of eligible households.

Since the growth in income in the 3rd decile (which is where the marginal low income households are generally found) is greater than the growth in the median income the impact of income seen in scenario 2 slightly reduces the level of fuel poverty.

The overall share of households in the low income fuel poverty quadrants (Low Income Low Energy Efficiency & Low Income High Energy Efficiency) increases further between 2020 and 2022 since this is also affected by higher fuel costs described in section 4.2.3 which affect household disposable income.

³⁸ See Chapter 3 of the [Methodology Handbook](#) for further details.

4.2.3 Energy prices

Under the LILEE metric the impact of fuel prices is small on the overall level of fuel poverty, however they do have a direct impact on the fuel poverty gap.

The default tariff [price cap for 2022](#) will increase in April 2022, by £693 on average for those on default tariffs paying by direct debit or £731 for those on standard credit and by £708 for prepayment customers, which is projected to increase the fuel poverty gap and slightly uplift the rate of fuel poverty.

Fuel poverty estimates are based on two years of survey data so half the data is based on prices from 2021 and half from 2022. The price changes modelled in these projections are based on the change in prices used for the 2020 fuel poverty statistics (2019 & 2020 calendar year prices) with 2021 fuel poverty statistics (2020 & 2021 prices) and 2022 fuel poverty statistics (2021 & 2022 prices). With the forthcoming price cap change mentioned above to be introduced in Q2 2022, the coldest quarter of 2022 is under the previous price cap so these projections don't capture the full extent of expected prices in the 2022/23 financial year.

4.3 Projected progress against the target, 2010-2022

The Government's statutory fuel poverty target for England is to ensure that as many fuel poor households as reasonably practicable achieve a minimum energy efficiency rating of band C^{39,40} by 2030, with interim targets of band E by 2020, and band D by 2025. See section 2.2. for more details on England's statutory fuel poverty target and the final progress against the 2020 milestone.

Under the LILEE metric, a household that achieves a fuel poverty energy efficiency rating of band C or above would not be measured as fuel poor, and therefore fuel poverty would be eradicated if all low-income households achieved an energy efficiency band C rating, or above. Progress towards the fuel poverty target is measured as the share of all low-income households who achieve an energy efficiency band C in 2030 and the interim milestones.

Within these projections, estimates are made for 2021 and 2022 of the share of low-income households who would meet the band C target and band D milestone at this period.

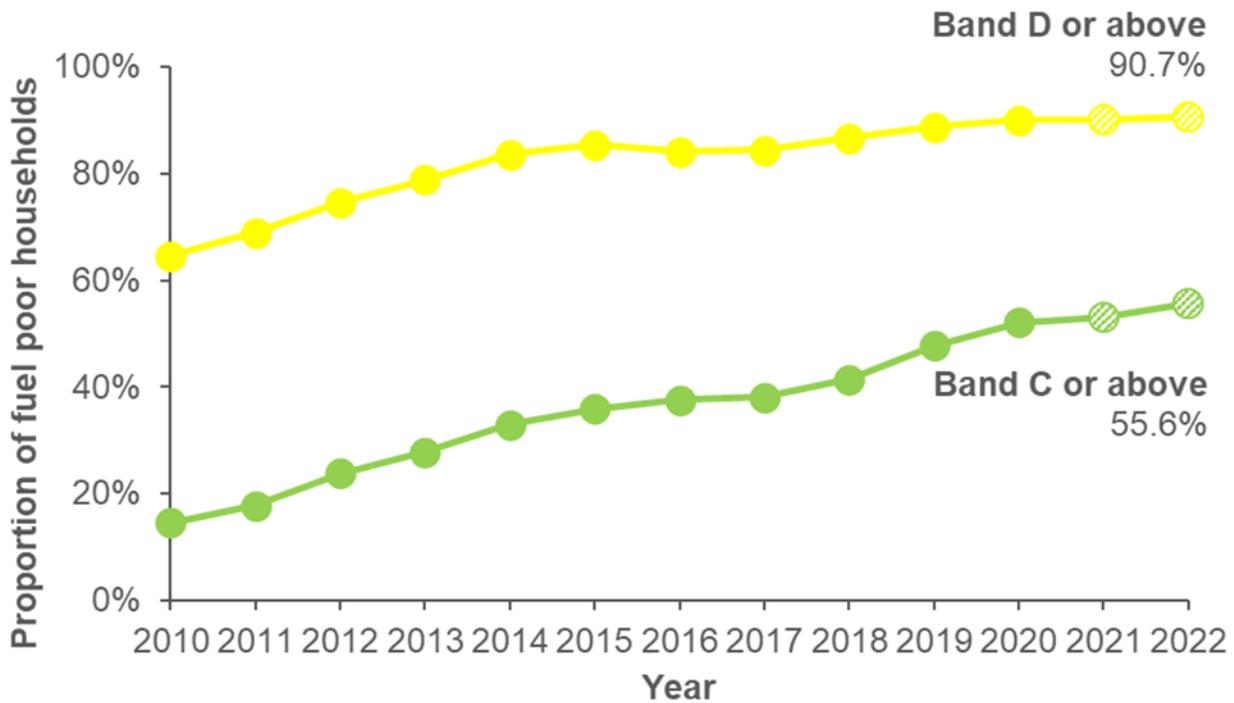
Table 4.3: Projected headline figures, 2020-2022³

Fuel poverty target	2020 Outturn (%)	2021 Projection (%)	2022 Projection (%)
Band D or above by 2025	90.1	90.1	90.7
Band C or above by 2030	52.1	53.0	55.6

³⁹ Energy efficiency rating is measured using Fuel Poverty Energy Efficiency Rating (FPEER).

⁴⁰ Household energy efficiency ratings are banded from G (lowest) to A (highest).

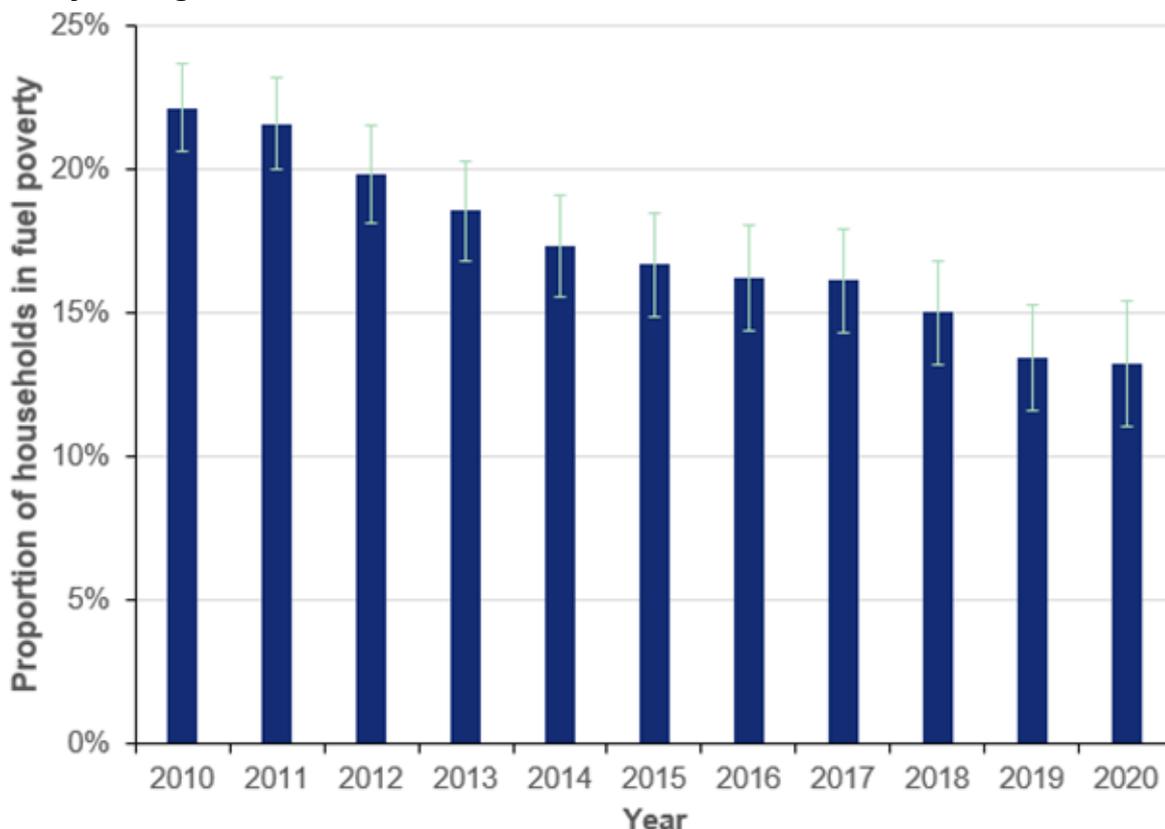
Figure 4.4: Further progress is projected to be made towards the band C fuel poverty target and band D interim milestone



Progress towards the interim milestones and the 2030 target is projected for 2022, with 55.6 per cent of low-income households projected to be in Band A to C, 90.7 per cent of low income households projected to be in Band A to D.

Annex A: Additional Data and Figures

Figure A.1: Proportion in fuel poverty, 2010 to 2020 - 95 per cent confidence intervals dictated by the light blue bars



In 2020, the proportion of households in fuel poverty is an estimate based on a sample of 11,152 households from the EHS. Individual survey cases in the EHS are weighted up to give the total number of households in the UK⁴¹. The estimated 3,158,000 fuel poor households in 2020 are based on 1,492 individual fuel poor households.

Based on the nature of the EHS sample, the 95 per cent confidence interval for the proportion of households in fuel poverty in 2020 is 13.2 per cent +/- 2.2 percentage points⁴². We can therefore be 95 per cent sure that the true proportion of households in fuel poverty in 2020 is between 11.0 and 15.4 per cent.

The confidence intervals are slightly wider this year due to the design factor being greater in 2020 (1.27) than in 2019 (1.20). This increase is due to the less representative sample within the EHS in 2020/21. In 2020/21 the interview survey achieved a response rate of 8 per cent compared with 47 per cent in 2019/20 with physical survey targets then selected from the achieved interview surveys. Survey response rates were affected by the enforced move to recruiting households by letter and telephone rather than on the doorstep. Weights are applied

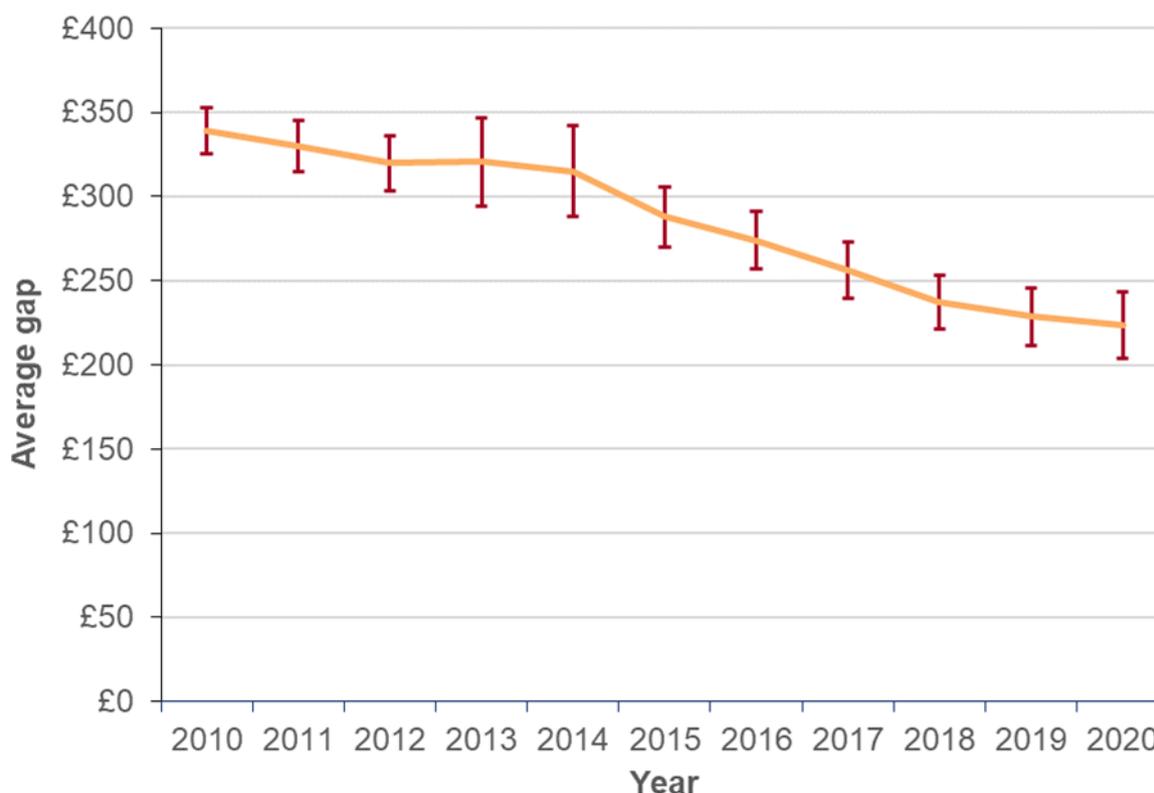
⁴¹ The current [EHS weighting methodology](#) was introduced in 2013 to 2014.

⁴² Calculated using the following formula: $p \pm 1.96(\text{design factor} * \text{standard error})$ where $p = 13.2\%$ and the standard error is calculated for a proportion $\text{sqrt} [0.132 * (1 - 0.132) / 1,492] = 0.88\%$. The EHS *design factor* = 1.27 (average design factor for the EHS sample).

to control for the changes each year in the achieved sample. Annex B provides more detail about the factors that have affected the sample.

The size of the 95 per cent confidence interval around the proportion of households in fuel poverty increases between 2010 and 2020. This is because the total sample size of the EHS has decreased by 31 per cent across this time period but the rate of fuel poverty is also falling. This has therefore reduced the number of cases that make up the fuel poor population each year, and the confidence we have in our estimates of the proportion has decreased slightly.

Figure A.2: Average fuel poverty gap, 2010 to 2020 (real 2020 prices)- 95 per cent confidence intervals dictated by the red bars



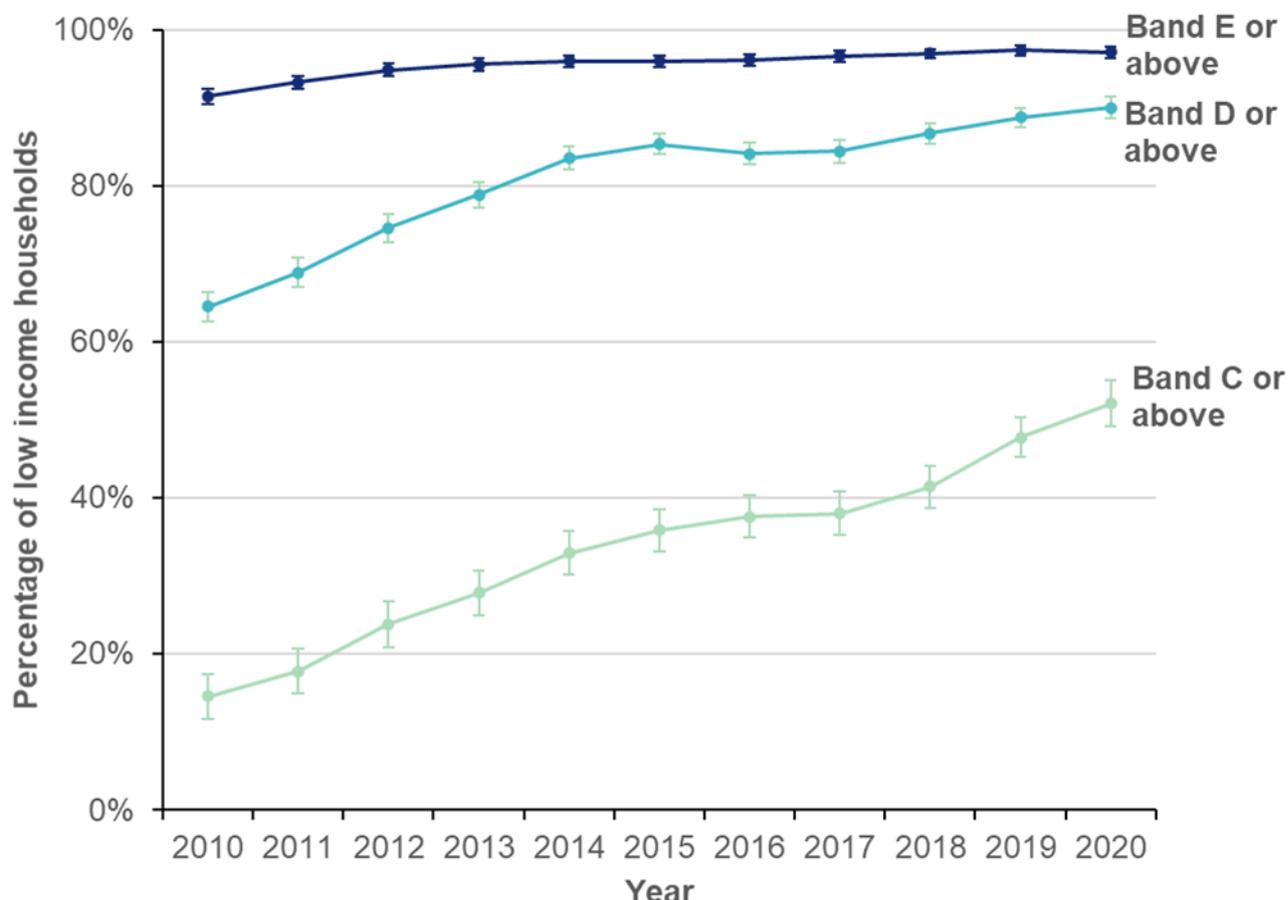
All fuel poor households have a fuel poverty gap based on their fuel expenditure and income relative to their nearest threshold to exit fuel poverty. The calculation of the average gap is the aggregate fuel poverty gap divided by the number of fuel poor households.

The 95 per cent confidence interval for the average gap in 2020 is £223 +/- £20⁴³. We can be 95 per cent certain that the true average gap in 2020 is between £204 and £243.

Similar to the proportion of households in fuel poverty, the size of the 95 per cent confidence interval around the average gap increases between 2010 and 2020, as the total sample size of fuel poor households in the EHS has decreased.

⁴³ Calculated using the following formula: $p \pm 1.96(\text{design factor} * \text{standard error})$ where $p = £223$ and the standard error is around £8. The EHS *design factor* = 1.27 (average design factor for the EHS sample).

Figure A.3: Progress against the fuel poverty target, 2010 to 2020 - 95 per cent confidence intervals dictated by the bars



The 95 per cent confidence interval around the estimate of the proportion of households in band C or above in 2020 is 52.1 per cent \pm 2.9 percentage points. We can be 95 per cent certain that the true proportion of low income households in band C and above in 2020 is between 49.2 and 55.1 per cent.

The 95 per cent confidence interval around the estimate of the proportion of households in band D or above in 2020 is 90.1 per cent \pm 1.4 percentage points. We can be 95 per cent certain that the true proportion of low income band D and above households in 2020 is between 88.7 and 91.4 per cent.

The 95 per cent confidence interval around the estimate of the proportion of households in band E or above in 2020 (97.2 per cent \pm 0.7 per centage points) is smaller than the confidence intervals around band D and band C or above, as this estimate is based on a larger sample size. We can be 95 per cent certain that the true proportion of low income band E and above households in 2020 is between 96.4 and 97.9 per cent.

Figure A.1 shows that the confidence intervals around the proportion of households in fuel poverty widen over time, due to the decrease in the EHS sample. The size of the confidence intervals around progress towards the target figures, however, remains similar between 2010 and 2020. This is because, although the EHS sample is decreasing, the proportion of households in more energy efficient properties is increasing. Therefore, the number of individual cases in each group increases and the confidence intervals do not widen.

As discussed in Section 2.3.5, Tables A.1 and A.2 show the change in annual domestic electricity and gas bills for each payment method. These compare the prices used for the 2020 fuel poverty statistics (2019 & 2020 prices) and 2021 statistics (2020 & 2021 prices) in real 2021 prices.

Table A.1 Annual domestic gas bills for prepayment customers decreased by 2.8 per cent between 2019|20 and 2020|21 (real 2021 prices) 2021⁴⁴

Gas method of payment	2019 20(£)	2020 21 (£)	Percentage change 2019 20-2020 21 (%)
Prepayment	644	626	-2.8
Standard Credit	705	652	-7.5
Direct debit	626	582	-7.0

Table A.2: Annual domestic electricity bills for prepayment customers increased by 3.7 per cent between 2019|20 and 2020|21 (real 2021 prices) 2021⁴⁵

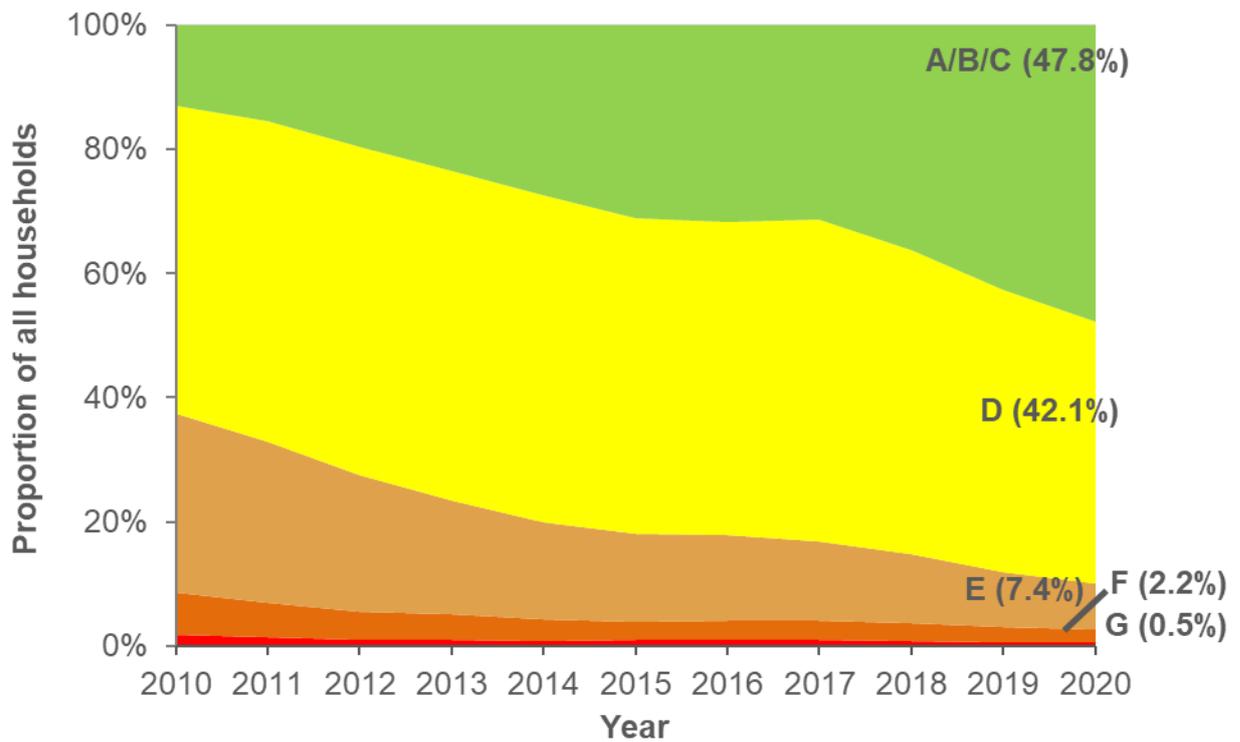
Electricity method of payment	2019 20 (£)	2020 21 (£)	Percentage change 2019 20-2020 21 (%)
Prepayment	710	736	3.7
Standard Credit	777	781	0.6
Direct debit	701	706	0.8

⁴⁴ Annual figures derived from [Annual domestic price statistics](#), Table 2.3.2. Figures are based on Standard Electricity tariffs, are in real terms and cover England and Wales. Figures used for 2020 fuel poverty dataset represent average of 2019 and 2020 and for 2021 average of 2020 and 2021 in real 2021 prices.

⁴⁵ Annual figures derived from [Annual domestic price statistics](#), Table 2.2.2. Figures are in real terms and cover England and Wales. Figures used for 2019 fuel poverty dataset represent average of 2018 and 2019 and for 2020 average of 2019 and 2020.

As shown in figure 2.3, 52.1 per cent of low income households are rated A-C compared with 47.8 per cent of all households in figure A.4. This demonstrates the combined effect of targeting energy efficiency measures to low income homes and the impact of the Warm Home Discount.

Figure A.4: The proportion of all households split by energy efficiency rating bands



Annex B: Impact of COVID-19 on the English Housing Survey

The principal data source used to model estimates of fuel poverty in England is the English Housing Survey (EHS). The estimates of fuel poverty are always based on two years of survey data to give sufficient sample size. The 2020 estimates are the result of surveys in 2019/20 and 2020/21. It is important to consider the impact of merging these years which are different both in terms of household circumstances through the Covid-19 period but also the survey methods used. Approximately half the weighting of these results comes from each of the merged financial years

- Surveys from 2019/20 were conducted before any restrictions to survey methods and daily life were introduced due to Covid.
- Surveys in 2020/21 were conducted using alternative survey methods.

B.1 Overview of survey methodology during Covid-19

In the 2020-21 English Housing Survey data, face-to-face interviews were replaced with telephone interviews and internal inspections of properties were replaced with external inspections and linking administrative data sources. Ordinarily such changes would not be done without thorough testing to examine the impact on survey response rates, data collection and reporting. Given that such testing was not possible, it is not clear to what extent changes observed in 2020-21 are the result of the change in mode, or real change (e.g. a change in people's housing circumstances as a result of COVID-19).

There are a number of areas of additional uncertainty from the results this year.

- Low sample sizes in some sub-groups with lower than usual response rates. All tables continue to mark estimates based on less than 30 surveys.
- Confidence intervals are wider due to larger design factors reflecting that the achieved sample is less representative of the population. This is explored in Annex A.
- With lower response rates the survey is less representative of the population of English households. The combination of alternative survey methods and changes in personal circumstances caused by the pandemic has led to some changes in the type of households taking part. While the detailed weighting methodology used by the EHS can control for much of this, with such large changes not all impacts are picked up.

Further information is available in the [headline EHS report](#) for 2020/21.

B.2 Summary of sample achieved

As a result of survey recruitment and delivery methods, the composition of the EHS achieved sample changed significantly between 2019-20 and 2020-21. For example, in 2020-21, there were significantly more outright owners and fewer renters in the sample. There was also a

skew toward older respondents (aged 65 or over), and fewer households with children than in 2019-20.

These changes may be the result of changing housing circumstances, but it also likely that both the way the survey needed to be carried out and household circumstances prevented some households from taking part in the survey during the pandemic (e.g. home schooling, caring responsibilities, and ill health and well-being meant that some households would be less inclined to take part in the survey).

The changes made to the English Housing Survey because of COVID-19 also resulted in a smaller sample size with 5,288 physical surveys in 2020-21 down from 5,864 in 2019-20.

B.3 Population changes

The EHS reports that the COVID-19 pandemic and associated restrictions resulted in a different pattern of movement between households as people migrated around the country following changes in working practices and education as these moved online during lockdowns. This saw a reduction in house sharing amongst unrelated adults and there was likely an increase in multi-generational households as adult children moved in with their parents, or parents moved in with their children. However, many of these “additional adults” in the household were not captured in the English Housing Survey because they were not considered by respondents to be permanent members of the household.

B.4 Income equivalisation

Fuel poverty is modelled based on the total income of a household excluding deductions for income tax & national insurance, housing costs and some benefits given specifically to support people living with a disability. This residual income is then equivalised based on the number and age of people in the household that income needs to support.

Equivalisation is a key part of the fuel poverty income calculation to reflect that larger households need more income to maintain the same standard of living as smaller households. The full equivalisation process is set out in the Methodology handbook. A household of 2 adults is taken as a reference point with larger households seeing their income reduce by equivalisation and smaller households seeing this increase. An illustration below for different households with an income after housing costs of £20,000.

	Equivalised AHC income
1 adult	£34,480
2 adults	£20,000
2 adults + 1 child under 14	£16,670
2 adults + 3 children under 14	£12,500
4 adults	£10,870

In 2019 the total AHC equivalised income was £655 billion, 3.9 per cent lower than the total un-equivalised AHC income reflecting that households on average were larger than the reference point of two adults. Based on the lower population count identified in the EHS in 2020 the total AHC equivalised income was £700 billion, 1.6 per cent lower than the total un-equivalised AHC income. This lower impact reflects the smaller average size of households in 2020 and hence equivalised incomes have grown faster than raw incomes in the 2020 dataset.

BEIS has carried out sensitivity analysis on this impact and while it does have a significant impact on the raw income values and median income it had a negligible overall impact on the share of households with income below the 60 per cent of median income across all tenures.

B.5 Impact on income modelling

As shown in figure 2.7, the median after housing costs equivalised income rose by 9.4 per cent between the combined years used for the 2019 (2018-19 and 2019-20) and 2020 (2019-20 and 2020-21). Increases in total income were seen across all income deciles.

There are at least two factors in the data collected in 2020-21 that drive these large increases in income.

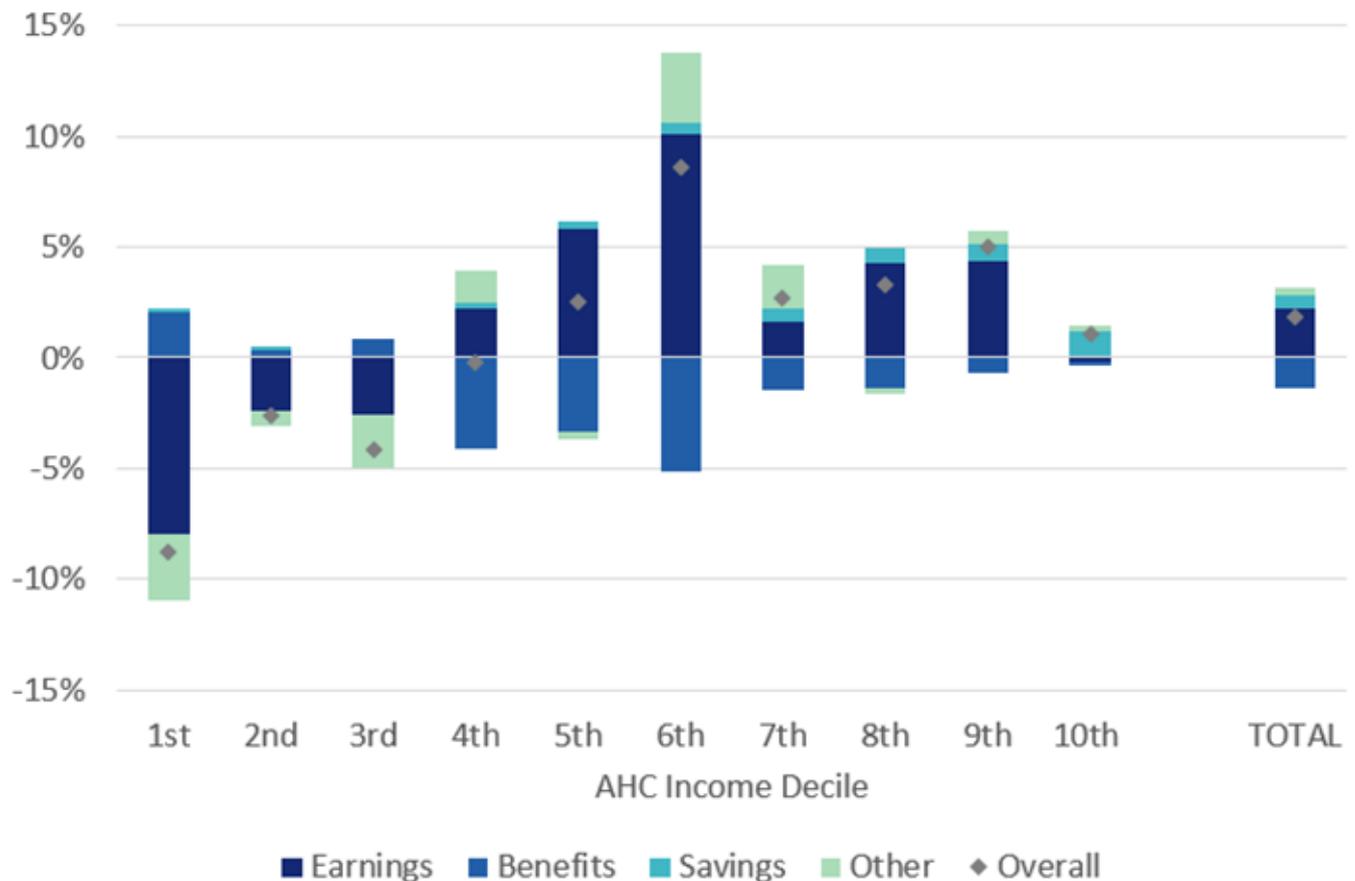
- Despite a range of efforts to recruit a representative sample and manage the biases through weighting there are a higher share of households currently or previously working in professional occupations which has contributed to a slight shift towards higher incomes.
- The total number of households identified in the EHS in England increased by 207,000 (1 per cent) but the number of people identified decreased by 3 per cent which affects the equivalisation factors.

When looking at these trends in income it is important to remember that throughout 2020-21 the Government offered support to employees through the [Coronavirus Job Retention Scheme](#) and the self-employed through the [Self-Employed Income Support Scheme](#) to protect the incomes of those whose work was impacted by the pandemic. These furlough payments received by workers are counted as earnings in the statistics shown. There were also increases both to the number of people claiming benefits and a temporary increase to the value of Universal Credit.

The chart below measures the change in the total amount of income received by each decile broken down by source of income.

The EHS is not a longitudinal survey, so the changes shown are not reflecting the income changes of particular households but the net effect of households seeing increases and decreases in income. Even after the impact of furlough, earnings fell in deciles 1-3 but increases to benefits offset the loss of earnings potential for low income households. The middle deciles which include the median show high growth in earnings. A shift in the sample towards more professional people is likely to have driven some of this increase.

Figure B.1 Change in average income by source and decile 2019-2020



As shown in figure B.1, there have been substantial changes in the estimated incomes by source across the deciles between the 2019 and 2020 datasets. These reflect both real changes to the income distribution with low income households affected more significantly but also a shift in the sample to more higher earning households.

Overall, the median income (before housing costs and equivalisation) received by English households increased by 3.0 per cent. Median housing costs fell by 2.8 per cent, resulting in the median AHC income before equivalisation rising by 3.6 per cent. The lower population estimate results in an increase in median equivalised AHC incomes of 9.4 per cent. The impact of equivalisation is seen across the income distribution and therefore is not considered to have significantly affected the estimates of fuel poverty.

Annex C: Measuring Fuel Poverty in England

This annex provides more detailed information on the following: how the Low Income Low Energy Efficiency (LILEE) indicator of fuel poverty works, and understanding the drivers of fuel poverty, data sources, and methodological updates for the 2020 estimates. A glossary of key terms used throughout this report and supporting links can be found at the end of the Annexes.

C.1 Introduction to Low Income Low Energy Efficiency

Fuel poverty in England is now measured using the LILEE⁴⁶ indicator, which considers a household to be fuel poor if:

- it is living in a property with an energy efficiency rating of band D, E, F or G as determined by the most up-to-date [Fuel Poverty Energy Efficiency Rating \(FPEER\) Methodology](#) - this is depicted by the horizontal threshold in Figure C1; and
- its disposable income (after housing costs and energy needs) would be below the poverty line⁴⁷ as depicted by the sloping line threshold in Figure C1.

Low Income Low Energy Efficiency is a dual indicator, which allows us to measure not only the extent of the problem (how many fuel poor households there are), but also the depth of the problem (how badly affected each fuel poor household is). The depth of fuel poverty is calculated by taking account of the **fuel poverty gap**. This is a measure of the additional fuel costs (in pounds) faced by fuel poor households to compared with the required fuel costs at the threshold that would make them non-fuel poor. This is illustrated in Figure C1, where the indicator consists of:

- the **number** of households that have both low incomes and low energy efficiency (shown by the shaded area in the bottom left-hand quadrant in C1; and
- the **depth** of fuel poverty among these fuel poor households. This is measured through a **fuel poverty gap** (shown by the vertical arrows in Figure C1), which represents the difference between the required energy costs for each household and the nearest fuel poverty threshold (in pounds).

To get a sense of the depth of fuel poverty at a national level, the fuel poverty gap for each individual household is aggregated across all fuel poor households to produce an overall **aggregate fuel poverty gap**.

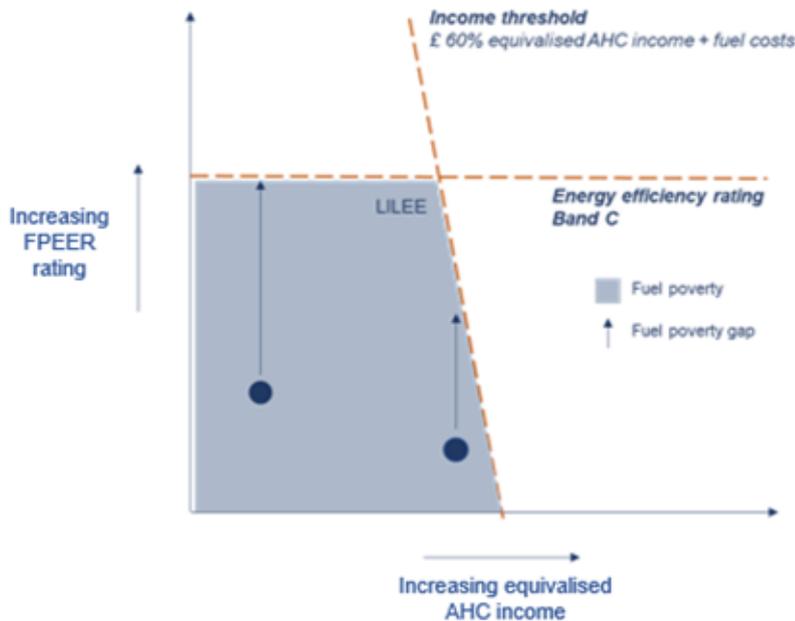
The fuel poverty indicator contains a relative measure, as it compares households to national income thresholds but also uses an absolute energy efficiency rating. A change in income will only have an impact on fuel poor households when they see relatively larger income changes (increase or decrease) than the overall population. The absolute measure of energy efficiency

⁴⁶ The calculation of the LILEE metric is set out in detail in the [LILEE Fuel Poverty Methodology Handbook](#).

⁴⁷ The poverty line (income poverty) is defined as an equivalised disposable income of less than 60% of the national median, as shown in Section 2 of the ONS release ['Persistent Poverty in the UK and EU'](#).

means that improving the energy efficiency rating to at least band C will remove the household from fuel poverty regardless of income and fuel costs.

Figure C1: Fuel poverty under the Low Income Low Energy Efficiency indicator



Fuel poor households (bottom left-hand quadrant of Figure C1) include some households who may not traditionally be considered poor but are pushed into fuel poverty by their high energy requirements and low energy efficiency (this is reflected in the gradient of the income threshold).

Those in the bottom right-hand quadrant also have low energy efficiency but their relatively high incomes mean that they are not considered to be fuel poor.

Those in the top right-hand quadrant have both high incomes and high energy efficiency, and are therefore not fuel poor.

While it is recognised that households in the top left-hand quadrant have low incomes, they also have high energy efficiency and so are not considered to be fuel poor.

C.2 How the Low Income Low Energy Efficiency (LILEE) indicator of fuel poverty works

Fuel poverty is estimated by calculating each household's position relative to two thresholds (illustrated in Figure C.2). The first is an absolute energy efficiency threshold whereby a household cannot be considered fuel poor if it has an FPEER rating of band C or above. The second threshold is a relative measure which considers a household's disposable income;

After Housing Cost (AHC) income⁴⁸. The AHC income is defined by equivalising a household's income after deducting their housing costs. The low income threshold is then calculated by taking 60 per cent of the median income value having ranked all the AHC incomes in the dataset and adding on the household's equivalised required fuel costs. To be fuel poor under the LILEE indicator, a household's energy efficiency rating must be below FPEER band C and their equivalised AHC income must be below the income threshold.

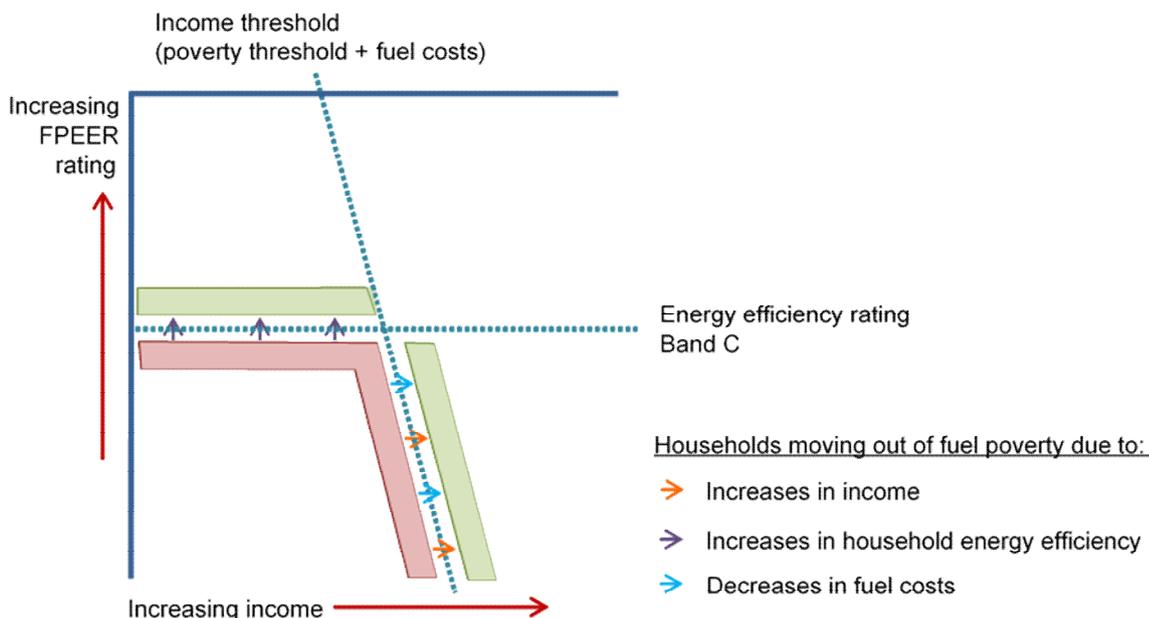
As with the previous LIHC indicator, for incomes or fuel costs to affect the number of households in fuel poverty under the LILEE measure, they must change by a greater or lesser amount for those in fuel poverty, than for those not in fuel poverty. Fuel price changes have a limited effect compared with changes to income on the number of households in fuel poverty. This is because fuel costs are relatively small for most households relative to a household's income and thus unlikely to move across the income threshold for fuel poverty. The fuel prices through do have a significant effect on the fuel poverty gap.

While the energy efficiency rating threshold and income thresholds under the LILEE metric define the number of fuel poor households, the depth of fuel poverty is measured through the fuel poverty gap. This is the monetary difference between a household's current fuel costs and the fuel costs they need to not be considered fuel poor. The fuel poverty gap is indicated by the upward pointing arrows in the LILEE quadrant in Figure C1, which show households can exit fuel poverty by either attaining a band C energy efficiency or through the income threshold by which their fuel costs have decreased to a value that they are no longer under the low income threshold.

Figure C2, below, illustrates how fuel poor households may move out of fuel poverty, either due to an increase in disposable income and/or an increase in household energy efficiency rating.

⁴⁸ As set out in section 3 of the Fuel Poverty [Methodology Handbook](#) for LILEE, benefit payments made specifically to the HRP and any partner to cover the additional costs of living with a disability including Disability Living Allowance (DLA), Personal Independence Payments (PIP) and Attendance Allowance (AA) are excluded from the household income used for LILEE.

Figure C.2: Movement across the income and fuel costs threshold due to either increases in income, reductions in energy consumption or a combination of both



C.3 Drivers of Fuel Poverty

There are three key elements in determining whether a household is fuel poor: Household Income, Energy Efficiency Rating, and Fuel Prices.

Measuring household income

The Low Income Low Energy Efficiency indicator is based on modelled incomes calculated after housing costs and council tax have been taken into account, since money spent on housing costs cannot be spent on fuel. Mortgage payments, rent payments and council tax are deducted from the full income of each household to give an After Housing cost (AHC) measure of income.

Once housing costs are deducted, incomes are then equivalised to reflect the fact that different household types will have different spending requirements. For example, a single person on a given income will usually have more disposable income than a family of four on the same income. The equivalisation factors used for income calculations are the same as in the Department for Work and Pensions (DWP) [Households Below Average Income \(HBAI\)](#) statistics. These equivalisation factors were devised by the Organisation for Economic Co-operation and Development (OECD) and are widely used across Europe.

Measuring household energy requirements

The fuel poverty definition uses household energy requirements in two ways. Firstly, the energy efficiency rating sets the low energy efficiency thresholds. Secondly, the required fuel costs which includes fuel for heating the home, heating water, lighting, appliance usage and

cooking. In calculating the required fuel costs, the energy costs are modelled, dependent on the following factors:

- The economic circumstances of householders (for example, if they are working from home regularly, unemployed or retired they will be at home for longer periods of the day);
- the heating system and the type of fuel(s) used, and
- the dwelling characteristics.

This allows energy requirements to be standardised to ensure households maintain an adequate standard of warmth⁴⁹ based on their household composition and energy set-up. In reality, households may under or over-heat their home, relative to the recommended levels.

Measuring fuel prices

Detailed fuel prices are allocated to each household in the data, based on reported fuel type, regional location and method of payment. This allows us to model the unit cost of energy for each household based on their energy set-up and assign the appropriate standing charge.

To calculate fuel poverty a household's required energy costs must be modelled. This is calculated by taking the number of units of energy consumed, multiplying by the cost of a unit of energy, and adding the required standing charge for each household.

Like incomes, fuel costs are then equivalised by the number of people in the household, to reflect the fact that different sizes of households will have different energy requirements. For example, a family of four will need to spend more on energy than a single person living in the same home.

C.4 Data Sources

The English Housing Survey (EHS)

Fuel poverty is modelled using data from the [English Housing Survey \(EHS\)](#). The EHS is an annual national survey of people's housing circumstances, household income and the condition and energy efficiency of housing in England. It is commissioned by the Department for Levelling up, Housing & Communities (DLUHC), covers all tenures (private and social) and involves a detailed physical inspection of properties by professional surveyors.

The two key components of the English Housing Survey for fuel poverty modelling are:

- the interview survey with the householders living in the dwelling; and
- the physical survey (survey of the physical features and condition of the dwelling).

Each year, approximately 11-12,000 households take part in the interview. Around half of these properties are selected for the follow-up physical survey (key to fuel poverty energy modelling), involving a physical inspection of the property by professional surveyors.

Two years' worth of EHS data from households selected for both the interview and physical surveys are combined to ensure an adequate sample size for fuel poverty modelling. For the 2020 data, this covers the period between 1 April 2019 and 31 March 2021, and comprises 11,152 households over two consecutive data collection years (2019/20 and 2020/21).

⁴⁹ An adequate standard of warmth is defined as 21°C for the main living area and 18°C for other occupied rooms. Further detail can be found in the [Methodology Handbook](#).

Therefore, users are advised to use caution when looking at year on year changes in fuel poverty, as the samples will not be independent. The headline results from the [2020 EHS](#) were published on 9 December 2021. Full data relating to the 2020 EHS, will be made available by DLUHC later this year through the UK Data Service.

Fuel Prices Data

The English Housing Survey does not collect information on fuel prices for households. Therefore, to estimate them for each household in the EHS, fuel price information is modelled using data from other sources including: BEIS [Quarterly Energy Prices](#); [ONS Consumer Price Index](#); and [Sutherland Tables](#). Further information on modelled fuel price data is available in the [Methodology Handbook](#).

C.5 Methodological Updates

Changes to the BREDEM model

There have been no changes to underlying methodology used to model household energy requirements using the [Building Research Establishment Domestic Energy Model](#) used for the fuel poverty modelling (BREDEM 2012 version 1.1).

Changes to the English Housing Survey (EHS)

Energy related data collection methodology update (2020 dataset)

For 2020, there were changes to both the interview and physical surveys due to the COVID-19 restrictions in England. Interviews were completed by telephone rather than face-to-face, whilst internal inspections were replaced by external inspections.

Due to the sudden nature of the restrictions, no thorough testing of this new methodology was possible. Given this, it is unclear how greatly this change of methodology affected the outcome versus how much is real change. Surveyors collected the physical inspection data using an assessment of the exterior of the dwelling together with a short interview carried out (socially distanced) to ask the occupants for details of items usually captured internally by the survey⁵⁰. This included items such as the type of heating system present, and extent of low energy lighting. Whenever possible, surveyors also used information from energy performance certificates (EPCs) and web-based tools such Google Street View and Rightmove to inform decisions.

Where data was missing (e.g. loft insulation present but no insulation thickness given) due to the data collection method changes, imputed default values were used consistent with the approach used in a full survey year.

The impact of these changes is presented in Annex B.

⁵⁰ [EHS 2020 physical survey form](#) highlighting data collected directly and indirectly by the surveyor.

Solid floor methodology update (2020/21 dataset)

Energy calculations require the internal dimensions of the surveyed rooms (living room, kitchen, bedroom and bathroom) to calculate the extent of solid floors on the basement/ground level to inform the calculation of ground floor heat losses.

As surveyors were unable to collect internal room dimensions in the 2020/21 survey year, internal dimensions from the EHS 2015/16 and 2017/18 combined year datasets were used to calculate proxy room areas to calculate the extent of solid floors. Analysis of 2019 data indicated that this change decreased the annual mean SAP rating by around 0.05 SAP points.

Drylining and internal wall insulation methodology update (2020/21 dataset)

Data on the presence of drylining and internal wall insulation was not collected in the 2020/21 physical survey. It was assumed there was not drylining present for all cases. The household questionnaire was used to determine whether there was any internal wall insulation present.

Changes to fuel prices methodology

In 2020, there were no changes to the fuel prices methodology.

Changes to income methodology

Some changes in income imputation have been made following the change to the Low Income Low Energy Efficiency metric. The full method is described in the Methodology Handbook but the low income imputation now takes place after some disability payments have been excluded rather than with these included.

Annex D: Fuel Poverty across the devolved nations

Fuel poverty is a devolved issue, with each nation in the UK having its own fuel poverty definition, targets and policies to tackle the issue. This is set out in brief below, alongside the latest available estimates produced by each devolved nation.

D.1 Scotland⁵¹

The [Fuel Poverty \(Targets, Definition and Strategy\) \(Scotland\) Bill](#) was introduced to the Scottish Parliament on 26 June 2018 and the [Fuel Poverty \(Targets, Definition and Strategy\) \(Scotland\) Act 2019](#) received Royal Assent on 18th July 2019. This includes a new definition of fuel poverty in Scotland based on advice from an independent panel of experts and further scrutiny and amendment by the Scottish Parliament.

As set out in section 3 of the Act, a household is in fuel poverty if⁵²:

- in order to maintain a satisfactory heating regime, total fuel costs necessary for the home are more than 10 per cent of the household's adjusted (after housing costs) net income; and
- if after deducting fuel costs, benefits received for a care need or disability and childcare costs, the household's remaining adjusted net income is insufficient to maintain an acceptable standard of living. The remaining adjusted net income must be at least 90 per cent of the UK Minimum Income Standard (MIS) to be considered an acceptable standard of living, with an additional amount added for households in remote rural, remote small town and island areas (RRRSTI).

Extreme fuel poverty follows the same definition except that a household would have to spend more than 20 per cent of its adjusted net income (after housing costs) on total fuel costs to maintain a satisfactory heating regime.

Where a household is in fuel poverty, the fuel poverty gap is the annual amount that would be required to move the household out of fuel poverty. This is either:

- the amount required so that the fuel costs necessary for the home are no longer more than 10 per cent of the household's adjusted net income (after housing costs), or
- the amount required which, after deducting fuel costs, benefits received for a care need or disability and childcare costs, means the household's remaining adjusted net income is sufficient to maintain an acceptable standard of living.

The figure taken to determine the gap for each household is the lower of the two options. In addition to a new definition of fuel poverty, the Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act 2019 also set targets to eradicate fuel poverty. The 2040 targets are that:

⁵¹ [Scottish House condition survey](#)

⁵² See section 4 of the [SHCS 2019 methodology notes](#) for further details.

- no more than 5 per cent of households in Scotland are in fuel poverty
- no more than 1 per cent of households in Scotland are in extreme fuel poverty
- the median fuel poverty gap of households in Scotland in fuel poverty is no more than £250 adjusted to take account of changes in the value of money.

Scotland publishes fuel poverty data in the annual Scottish House Condition Survey (SHCS) Key Findings report. The figures presented in the [2019 report](#) are a best estimate of fuel poverty rates, extreme fuel poverty rates and the median fuel poverty gap under the new definition of fuel poverty as set out in the Act. They reflect amendments made to the legislation during the Bill process up to and including Stage 2.

The first set of fuel poverty estimates fully compatible with all of the elements of the new definition in the Act, including the [Fuel Poverty \(Enhanced Heating\) \(Scotland\) Regulations 2020](#) and [Fuel Poverty \(Additional Amount in respect of Remote Rural Area, Remote Small Town and Island Area\) \(Scotland\) Regulations 2020](#) which came into force on the 26th February 2020, requires additional information to be collected from 2020 onwards⁵³ and the production of a new MIS for RRRSTI areas.

In 2019, 613,000 households (24.6 per cent of all households in Scotland) were in fuel poverty, a similar level to 2018 (619,000 households or 25.0 per cent). The 2019 fuel poverty rate (24.6 per cent) is lower than that recorded between 2012 and 2015 (ranging between 27.7 per cent - 31.7 per cent).

It is estimated that 311,000 households (or 12.4 per cent) were living in extreme fuel poverty in 2019. This is similar to the previous year (279,000 households or 11.3 per cent) but a decrease from the peak of 384,000 households (or 16.0 per cent) in 2013.

The actual median fuel poverty gap for fuel poor households in 2019 was £750. This is higher than the median fuel poverty gap between 2015 and 2018. The median fuel poverty gap (adjusted for 2015 prices) for fuel poor households in 2019 (£700) is higher than in 2018 (£610) but similar to the median gap in 2012 to 2017.

D.2 Wales⁵⁴

Wales use a 10 per cent indicator. Households that need to spend more than 20 per cent of their income on fuel costs are also defined as being in severe fuel poverty. However, their methodology differs from Scotland in relation to the heating assumptions used. In March 2021 the Welsh Government published [Tackling fuel poverty 2021 to 2035](#) which includes targets to ensure that by 2035: no households are estimated to be living in severe or persistent fuel poverty as far as reasonable practicable; no more than 5 per cent of households are estimated

⁵³ 2020 SHCS fieldwork was suspended in March 2020 due to COVID-19 and did not resume. The [2021 SHCS](#) has been carried out by an external-only inspection, supplemented with alternative sources of data (e.g. from the Energy Performance Certificate) and the householder providing information to surveyors via telephone. This external+ approach has been designed to provide as reliable as possible estimates of key statistics, including on fuel poverty, energy efficiency and external repairs, while maintaining no contact with the household. The results of the 2021 SHCS are expected to be published in late 2022 / early 2023 and will include the first set of fuel poverty estimates fully compatible with all of the elements of the new definition in the Act.

⁵⁴[Fuel poverty estimates for Wales](#)

to be living in fuel poverty at any one time as far as reasonably practicable; and the number of all households “at risk” of falling into fuel poverty will be more than halved based on the 2018 estimate.

In 2018, the most recent data available, 155,000 households in Wales were living in fuel poverty, equivalent to 12 per cent of all households. Of these, 32,000 households were living in severe fuel poverty, equivalent to 2 per cent of all households. The percentage of households in fuel poverty has decreased from 26 per cent in 2008. Initial indications show that this is a result of increased household incomes and reduced household energy requirements due to energy efficiency improvements outweighing increases in fuel prices.

The Welsh Government are currently working on rebasing these figures taking into account the effects of the COVID-19 pandemic and recent significant energy price rises.

D.3 Northern Ireland⁵⁵

Northern Ireland uses a 10 per cent indicator but has no statutory target. The approach has been to assist those private sector households most at risk of fuel poverty through schemes such as Affordable Warmth.

In order to provide more up to date figures, NIHE commissioned the Building Research Establishment (BRE) to model estimates of the levels of fuel poverty in Northern Ireland in 2017 and 2018. Using 2016 Northern Ireland House Condition Survey (NIHCS) data as a base, BRE adjusted fuel prices and household incomes, and simulated the installation of energy efficiency improvement measures, all to 2017 and 2018 levels. The number of fuel poor households in 2017 was estimated to be 128,000, equivalent to 17 per cent of all households and in 2018, the estimates were 131,000 fuel poor households, equivalent to 18 per cent of all households.

The next release in the series of [modelled fuel poverty estimates](#) (using the 2016 HCS as a base) for Northern Ireland are due February 2022. In 2016, an estimated 160,000 households were fuel poor, 22 per cent of the total. This represents a significant improvement since 2011 when the figure was 42 per cent (294,000) of the total. This improvement is a result of a focus from the Northern Ireland Housing Executive (NIHE) and the Department for Communities (DfC) to tackle poor energy efficiency in the housing stock since 2011 and lower than average fuel prices (particularly gas and electricity – depending on payment method) and a decrease in household energy use.

D.4 Summary

Due to both definition and methodological differences in fuel poverty for each devolved nation, the figures are non-additive (i.e., should not be combined) in relation to a UK total. More details of the devolved surveys and fuel poverty measures in each of the devolved nations can be found in Section 1.3 of the [Methodology Handbook](#).

⁵⁵ [Estimates of fuel poverty in Northern Ireland in 2017 and 2018](#).

Annex E: Change to the reporting of households in receipt of benefits

One of the tables included in the set of Detailed tables estimate the number of households in England who are in receipt of benefits (Table 34). BEIS has previously acknowledged that the figures based on the total households reporting receiving benefits is an underestimate because the historic method only captured benefits reported in the English Housing Survey (EHS). The systematic under-reporting of benefits received in national surveys, such as the EHS, has been noted alongside the publication of fuel poverty figures^{56,57}.

In addition the change in income metric introduced in 2021 from Low Income High Costs to the Low Income Low Energy Efficiency excludes the income from disability benefits in the fuel poverty calculation⁵⁸. This recognised that disability payments have a specific purpose of contributing to the additional costs of living with a disability, and thus should not be considered as income for the purposes of fuel poverty⁵⁹. Therefore, BEIS have refined the methodologies used to calculate the number of households in receipt of benefits to make this a more accurate estimate and align more closely with the new fuel poverty metric. Two additional tables have been published this year:

- Table 34a estimate of households receiving benefits excluding disability benefits
- Table 34b estimate of households receiving benefits including disability benefits

Historic methodology reporting on households in receipt of income

The number of households in receipt of benefits was largely estimated using respondents' self-declaration in the EHS. The EHS contains a comprehensive income module which collects information on several benefits. Fuel poverty statistics collate this data relating to the household reference person (HRP) and/or any partner of the HRP, to report on households who are in receipt of the benefits stated below. Note that this previous methodology only considered the HRP and/or any partner as a flag for whether the household was in receipt of benefits, and therefore does not account for other members of the household who may be in receipt of benefits.

⁵⁶ 2021 Fuel Poverty Statistics, [LILEE Detailed tables](#), Table 34

⁵⁷ State benefits on the [Family Resources Survey](#) (WP115)

⁵⁸ Fuel poverty [methodology handbook 2021](#): Low Income Low Energy Efficiency

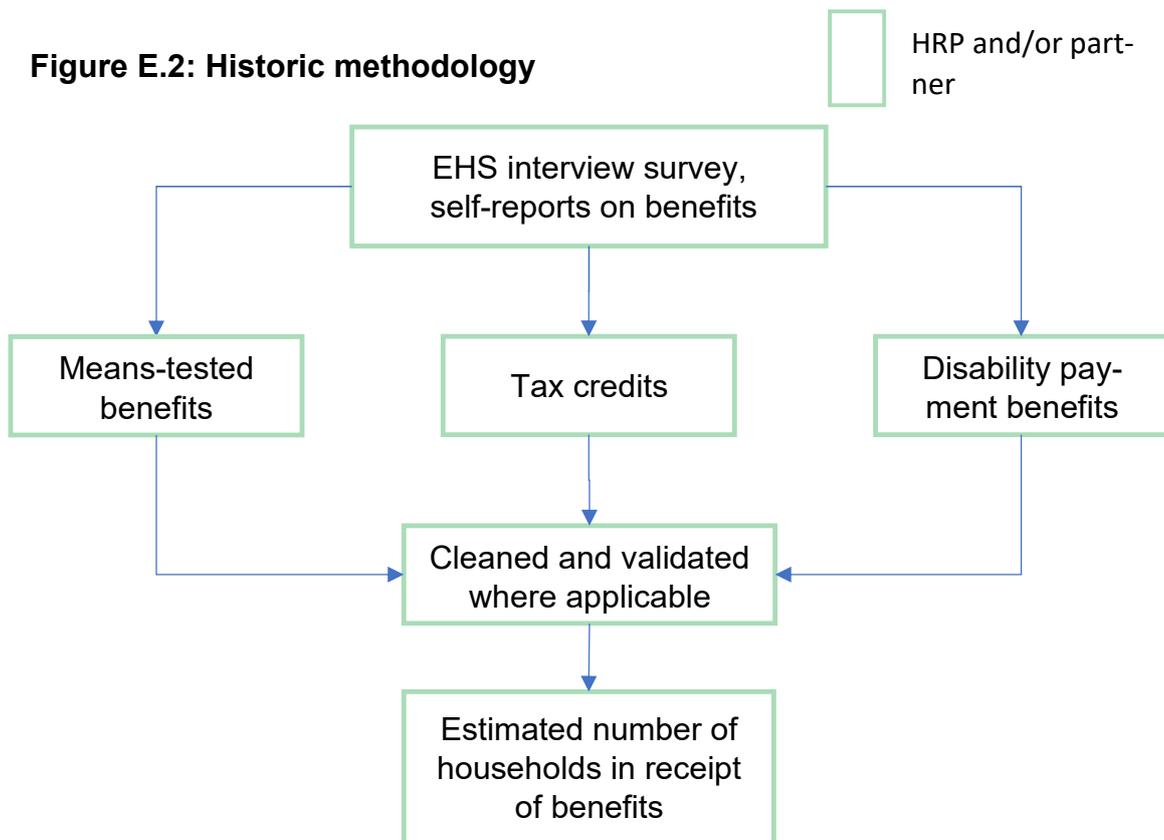
⁵⁹ [Fuel poverty strategy for England consultation](#): government response

Figure E.1: Benefits included in self-reported benefits flag (HRP and partner only)

Means-tested benefits:	Tax credits:	Disability payment benefits:
Income Support Universal credit Jobseeker’s allowance Employment and support allowance Pension credit Housing benefits Local housing allowance Council tax benefit	Child tax credit Working tax credit	Attendance allowance Disability living allowance Personal independence payment

In addition to cleaning the data and ensuring households qualify for the benefits they state they are in receipt of, there are a few benefit exceptions which undergo a slightly different calculation. Firstly, reports from households stating receipt of either working tax credit or child tax credit are validated against income thresholds and/or the receipt of other benefits. Secondly, receipt of council tax benefit is based on eligibility rather than responses in the EHS interview survey.

Figure E.2: Historic methodology



New methodology for reporting on households in receipt of incomes

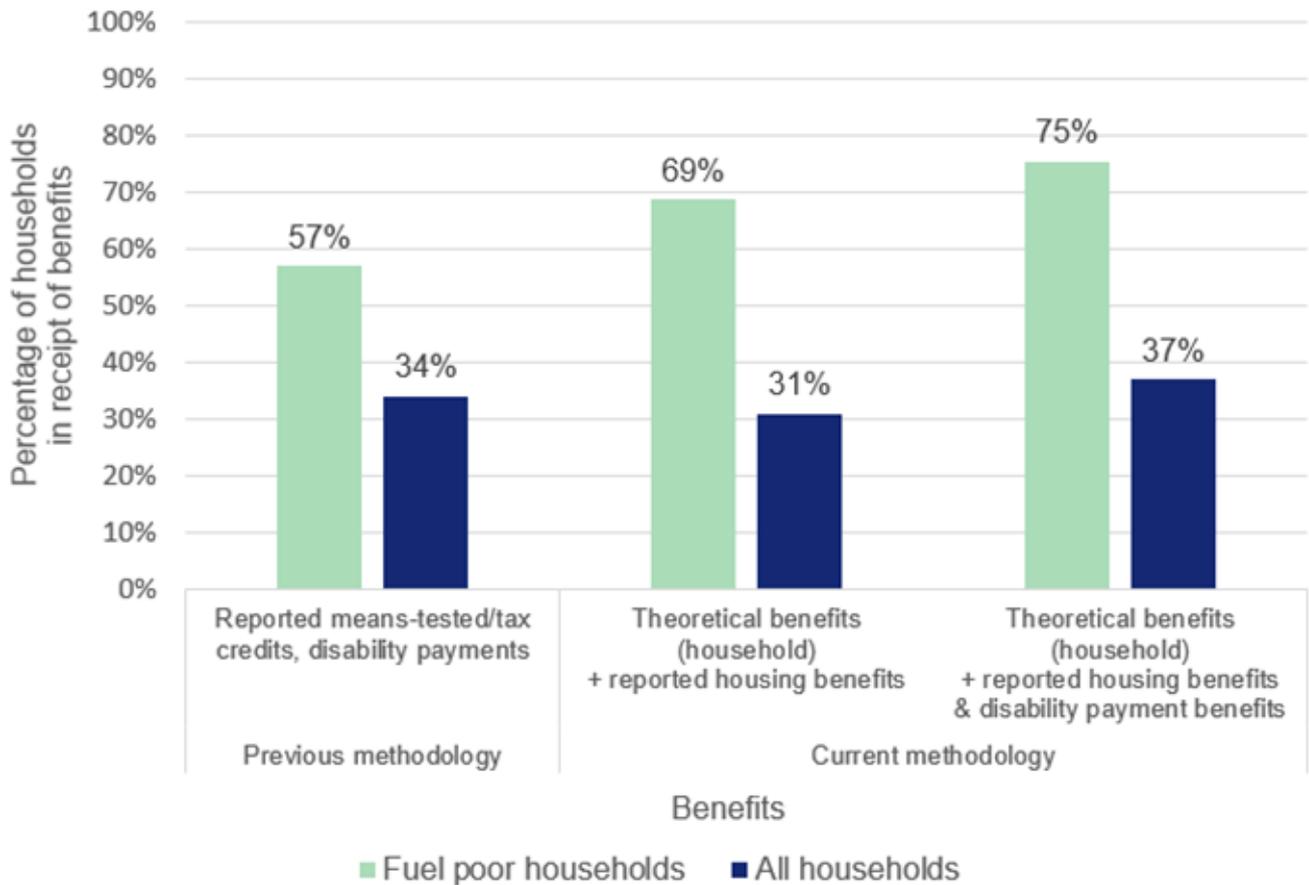
To address the limitations of under recording of benefits, BEIS has adopted an alternative methodology to report the number of households in receipt of benefits. This approach uses data from the EHS interview survey to identify households most likely to be in receipt of means-tested benefits based on modelling the benefit eligibility for EHS households and modelling this relative to the number of benefit claims in administrative statistics from the Department for Work and Pensions (DWP) and HM Revenue and Customs (HMRC). The model is run through several iterations to find the most suitable matches, with a greater weighting assigned to those household who self-report receipt of benefits. Additionally, this new methodology allows the fuel poverty statistics to account for other adults within the household in receipt of benefits, and therefore is no longer restricted to only the HRP and/or partner.

At present, these theoretical benefit flags have only been developed for a reduced number of benefits as listed below. Notably housing benefits and disability payment benefits are excluded. The statistics using the theoretical benefit flags show a large increase in the number of households in receipt of benefits, despite these limitations.

Figure E.3: Theoretical benefits flagged in addition to benefits listed in Figure E.1

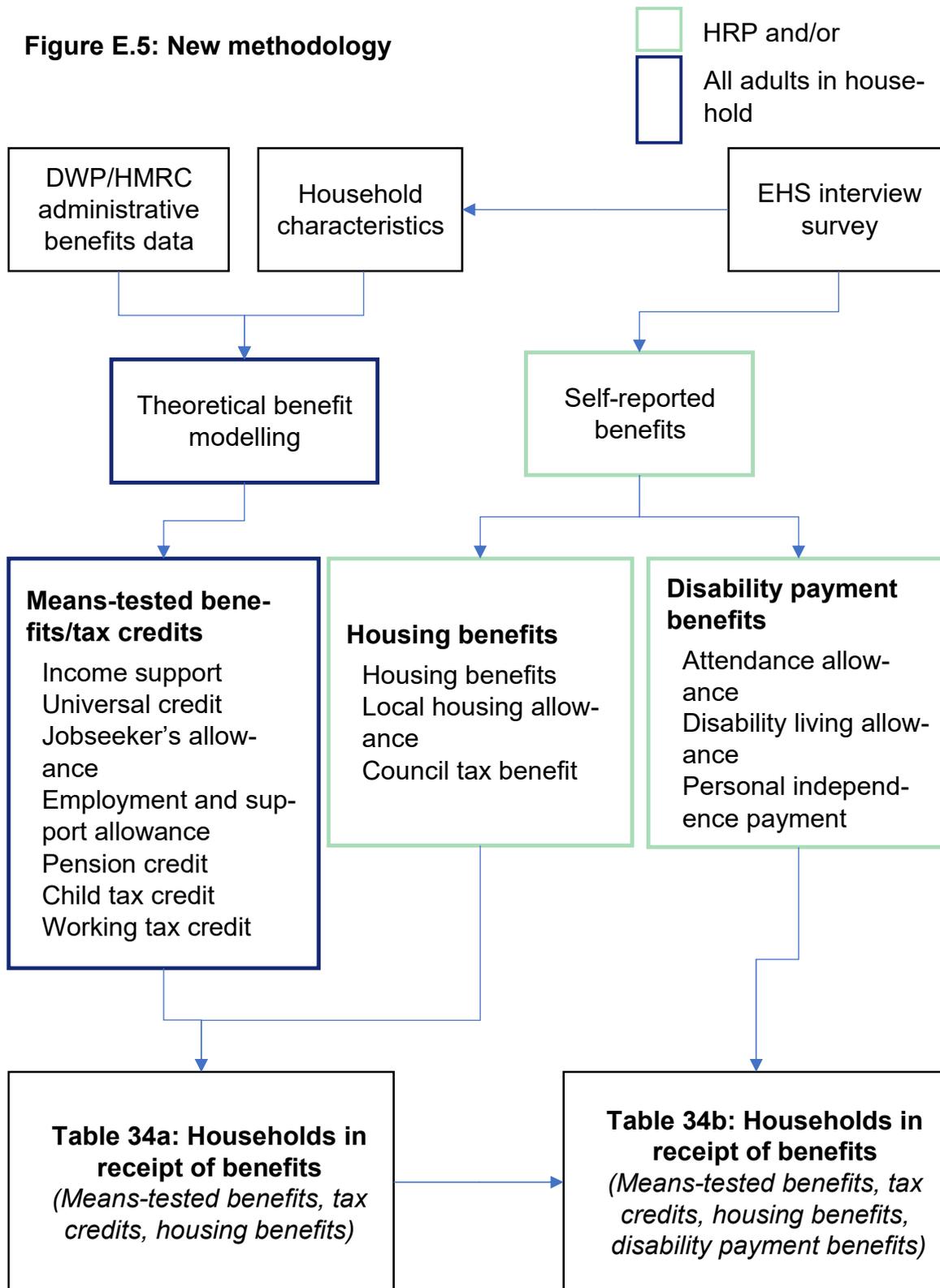
Theoretical benefits flags:	
Income Support	Pension credit
Universal credit	Child tax credit
Jobseeker's allowance	Working tax credit
Employment and support allowance	

Figure E.4: Summary of the share of households identified as in receipt of benefits under each method in 2020



The new methodology utilises the theoretical benefit flags where possible for members of the household, and self-reported housing and disability payment benefits by the HRP and/or partner from the EHS interview survey. Therefore, this accounts for all the benefits considered in the historic methodology whilst widening the statistical coverage by including additional adults within the household. The figures produced under this methodology are still expected to be an underestimate due to reliance on self-reporting which is limited to the HRP and/or partner.

Figure E.5: New methodology



User feedback

BEIS considers that it is more representative to report the share of households receiving benefits based on the new measures of theoretical benefits both including and excluding disability payments for completeness. This year both the reported and theoretical versions are published but it is proposed to discontinue the previous method (Table 34) and only include the more complete measures in future (Table 34a and 34b). We would welcome user feedback on this matter to fuelpoverty@beis.gov.uk.

Annex F: Relevant Links

F.1 Income Indicators

[Households below average income](#)

[Winter fuel payments](#)

[Cold weather payments](#)

F.2 Fuel Price Indicators

Actual expenditure on fuel (as percentage of total income) -

[Total](#)

[Weekly average](#)

[Fuel prices](#)

Number of customers on prepayment -

[Electricity](#)

[Gas](#)

Average annual bills by payment method -

[Electricity](#)

[Gas](#)

[Consumer vulnerability](#)

[Switching stats](#)

F.3 Housing Indicators

[Indicator SAP rating](#)

[Number of insulated homes](#)

[Local Authority housing investment on energy efficiency improvements](#)

F.4 Excess winter deaths

[Excess winter deaths](#)

Annex G: Accompanying tables

The following tables are available in Excel and ODS format on the [department's statistics website](#).

[Detailed tables LILEE \(2020 data\)](#).

[Trends tables LILEE \(2010-2020\)](#)

[Supplementary tables \(2020 data\)](#)

A fuel poverty dataset containing the underlying data will be made available on the [UK Data Service](#) in summer 2022.

Annex H: Technical information

An updated [methodology handbook](#) has been published alongside this publication. This sets out the method for calculating the headline statistics using the LILEE indicator and the detailed methodology for calculating the income, energy efficiency and fuel prices for each household.

Annex I: Acknowledgements

The fuel poverty modelling relies on the English Housing survey delivered by the Department for Levelling Up, Housing and Communities (DLUHC) and their contractors and expert modelling by the Building Research Establishment (BRE).

Annex J: Definitions

Term / Acronym	Definition
Adequate standard of warmth	Is defined as 21°C for the main living area and 18 °C for other occupied rooms.
Aggregate fuel poverty gap	The fuel poverty gap for each individual household is aggregated across all fuel poor households to produce a national total
AHC	After Housing Costs
Average fuel poverty gap	The average (mean) fuel poverty gap across all fuel poor households.
BEIS	Department for Business, Energy and Industrial Strategy
BREDEM	Build Research Establishment Domestic Energy Model
CW	Cavity Wall
DWP	Department for Work and Pensions
ECO	Energy Company Obligation
EHS	English Housing Survey
Equivalisation	An adjustment factor to standardise spending and energy requirements across households of different sizes.
Equivalised AHC income	After housing costs income equivalised by household composition
Equivalised fuel costs	Household fuel costs equivalised by the number of people in the house
FPEER	Fuel Poverty Energy Efficiency Rating
Fuel Poverty (LILEE)	A household is considered to be fuel poor if: they are living in a home below band C and were they to spend the required amount on fuel costs for the home, they would be left with a residual income below the official poverty line.
Fuel poverty gap (LILEE)	The difference in pounds between the required energy costs for each fuel poor household and the nearest fuel poverty threshold
LILEE	Low Income, Low Energy Efficiency
DLUHC	Department for Levelling Up, Housing & Communities
OECD	Organisation for Economic Co-operation and Development
ONS	Office for National Statistics
Percentage points	The arithmetic difference between two percentages
Real terms	An adjusted financial number after correcting for the effect of inflation
RHI	Renewable Heat Incentive
RPI	Retail Price Index
SAP	Standard Assessment Procedure
SW	Solid Wall

Annex K: Further information

Revisions policy

The [BEIS statistical revisions policy](#) sets out the revisions policy for these statistics, which has been developed in accordance with the UK Statistics Authority [Code of Practice for Statistics](#).

User engagement

Users are encouraged to provide comments and feedback on how these statistics are used and how well they meet user needs. Comments on any issues relating to this statistical release are welcomed and should be sent to: fuelpoverty@beis.gov.uk

The BEIS statement on [statistical public engagement and data standards](#) sets out the department's commitments on public engagement and data standards as outlined by the [Code of Practice for Statistics](#).

National Statistics designation

National Statistics status means that our statistics meet the highest standards of trustworthiness, quality and public value, and it is our responsibility to maintain compliance with these standards.

The continued designation of these statistics as National Statistics was confirmed in August 2017 following a compliance check by the Office for Statistics. The statistics last underwent a [full assessment](#) against the [Code of Practice for Statistics](#) in 2014.

Pre-release access to statistics

Some ministers and officials receive access to these statistics up to 24 hours before release. Details of the arrangements for doing this and a list of the ministers and officials that receive pre-release access to these statistics can be found in the [BEIS statement of compliance](#) with the Pre-Release Access to Official Statistics Order 2008.

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