Affording warm homes: the case for a social tariff to address fuel poverty

September 2025

Methodology and assumptions

This is the accompanying methodology to our *Affording warm homes: the case for a social tariff to address fuel poverty* report. It describes the model used to estimate the cost and impact of different tariffs for energy consumers in the report, how it works, definitions of key terms, the datasets it uses, and assumptions made when building it.

Overview of how the model works

The model links government and Office for National Statistics (ONS) datasets to sort households in England and Wales by income deciles, tenure, property type and property Energy Performance Certificate (EPC) bands. Energy usage and bills for these populations are then estimated based on property type and EPC band. More detail on each of these steps is provided below.

The model allows a tariff to be applied to eligible households, for example, a 20 per cent discount on energy bills for households in the lowest three income deciles. Results, such as total scheme cost, average bill reduction, and the number of households lifted out or put into fuel poverty are calculated.

The impact of the tariff after Minimum Level of Energy Efficiency standard (MEES) regulation for both private and social rented properties, proposed to come into force in 2030, is also calculated.

The model looks at households in England and Wales. As some datasets rely on collection methods such as the census which is a devolved matter and others that are national, some datasets only cover England and Wales, while others cover the whole of the UK. Households in England and Wales account for about 89 per cent of households in the UK (see table below), and so it is assumed that discounting data based on households in Scotland and

Northern Ireland would not impact proportions derived from UK datasets significantly, and so these are applied to the model without adjustment.

Number of households across the UK, 2022		
Country	**Number of households (millions)**	**% of households in UK**
England	24.4[1]	84%
Scotland	2.5[2]	8.6%
Wales	1.4[3]	4.8%
Northern Ireland	0.8[4]	2.7%
Total (UK)	**29.1**	

Definition of fuel poverty

The definition of fuel poverty varies across the governments in England and Wales. We define it as needing to spend over ten per cent of income, after housing costs, on energy bills. Although it is not part of its official definition of fuel poverty, the Westminster government also reports on this number for England.[5] For more information on these definitions, and our decision to adopt this definition, see page 6 of the report.

Calculating the price of energy

An electricity bill is made up of a daily standing charge and a charge per unit of energy consumed. Both the standing charge and unit rate vary between consumers, based on factors such as their supplier and location. Gas bills work in the same way. Ofgem caps both the standing and unit rate charges, limiting consumers' total bills.[6] For this analysis, a 12 month average of these caps, covering the period between 1 October 2024 and 30 September 2025, was used. This provides an upper limit to households' energy bills. As this represents the highest bills households are likely to have experienced, it represents the maximum possible fuel poverty impact and highest cost scenario for the social tariff. The caps and averages used can be found in the table below.

For the MEES calculation, it is assumed that current energy prices will remain constant to 2030. There is significant uncertainty about future

energy prices, including around reform of the energy market and levies, so we have decided to use current energy price cap data. Cornwall Insights expects energy prices to decline slightly in 2030, which would reduce the cost of the tariff so, by keeping prices at the current levels, we are possibly slightly overestimating the cost of the social tariff. [7] The government could view this as a worst case cost scenario.

Accounting for the Warm Home Discount (WHD)

The Warm Home Discount (WHD) is a £150 energy credit given to eligible households to help them pay for energy during the winter. The WHD is paid through an increase in daily standing charges and equates to around £22 per year for the average dual fuel household.[8] As we recommend the WHD does not continue under a social tariff, we removed these costs for the purposes of this analysis.

The £22 per year cost equates to a £0.06 bill reduction per day which was equally spread across the gas and electricity standing charges (see below).

Price caps and costs used to estimate energy bill amounts					
		Electricity		Gas	
Year	From-to (sources are linked)	Price cap per kWh (pence)	Daily standing charge (pence)	Price cap per kWh (pence)	Daily standing charge (pence)
2025	1 Jul – 30 Sep	25.73	51.37	6.33	29.82
	1 Apr – 30 Jun	27.03	53.8	6.99	32.67
	1 Jan – 31 Mar	24.86	60.97	6.34	31.65
2024	1 Oct – 31 Dec	24.5	60.99	6.24	31.66
WHD cost			0.03		0.03
12 month average with WHD removed		25.53	56.75	6.48	31.42

Datasets used

Summary of sequence of dataset linking

The model is based on linking datasets on five key variables. For example, each income decile is proportionally split into three tenures, then each of these are proportionally spilt into seven property types and so on. The variables are linked in the order shown above.

Income deciles

Sources: 'The effects of taxes and benefits on household income, disposable income estimate', Table 14, ONS, 2 May 2025. Data covers earnings from 2023/24

Department for Levelling Up, Housing and Communities, December 2024, 'English Housing Survey 2022 to 2023 headline report', chapter 1: Profile of households and dwellings, and Welsh Government, December 2024, Household estimates, mid-2012 to mid-2023, data covers households in 2023.

Ministry of Housing, Communities & Local Government, 18 July 2024, 'English Housing Survey 2022 to 2023: affordability and cost of living - fact sheet', section 1, data covers costs of housing in 2023.

As defined in the report, we considered a household that had to spend over ten per cent of its income, after housing costs, on energy as being in fuel poverty. Average income after housing costs for each income decile was calculated by taking the equivalised disposable income before housing costs for each decile and reducing this by the average percentage of income spent on housing costs. Housing costs varied by tenure and income decile.

According to the EU, the equivalised disposable income is the total income of a household, after tax and other deductions, available for spending or saving, divided by the number of household members converted into equalised adults; household members are equalised or made equivalent by weighting each according to their age.[9] This definition of income was chosen as it enables comparisons across different household types.

The number of households in each income decile was scaled down to only cover England and Wales, based on the percentage of households in the UK that are found in each country.

Tenure

Source: ONS, 2 May 2025, 'The effects of taxes and benefits on household income, disposable income estimate', table 15

The latest data, from 2023-24 was used.

This dataset covers UK households and details the percentage of households in each income quintile, ranked by equalised disposable income, whose tenure is private rented, social rented, owner occupied and rent free. Tenure was included as a variable in the model to enable analysis of the impact of MEES regulation, due to come into effect in 2030, on private rented properties that will require households on EPC bands D or below to be upgraded to an EPC C at least.

Those living rent free, approximately only 1.5 per cent of the population, were ignored as this category was not reported in any of the other datasets used and so could not be incorporated into the model.

Property type

Source: Ministry of Housing, Communities and Local Government, 'Annex tables for English Housing Survey 2023 to 2024 headline findings on demographics and household resilience', chapter 1 dataset, tab AT1_6

The latest data, from 2023-24 was used.

Energy usage can be robustly estimated based on property type and EPC band, so households were further split into these categories. The dataset covers households in England. It was assumed that the proportion of each tenure broken down into property type is similar in Wales.

The property types used were detached, semi-detached, end terrace, mid terrace, bungalow, converted flat and purpose built flats as these were compatible with the EPC dataset. This meant that more granular data, for example further breaking down purpose built flats into low and high rise, were added together.

EPC Band

Source: Department for Energy Security and Net Zero (DESNZ) and Department for Business and Trade (DBT), 27 June 2024, 'National Energy Efficiency Data-Framework (NEED) data explorer'

The latest data, from 2022 was used.

Energy usage can be robustly estimated based on property type and EPC band, so households were further split into these categories.

The dataset uses the Valuation Office Agency (VOA) database of all domestic properties in England and Wales and details estimated consumption by property and household characteristics. The property type and EPC section of the data covers just over 14.5 million, or around 60 per cent, of the households in England and Wales. The VOA explains that "around a third of domestic properties in England and Wales do not have an EPC rating, such as owner-occupied properties which have not been sold since EPC ratings came into use." [10]

Energy usage

Source: DESNZ and DBT, 27 June 2024, 'National Energy Efficiency Data-Framework (NEED) data explorer'

The latest data from 2022 was used.

Energy use is broken down into average gas consumption per household and average electricity consumption per household.

The dataset uses the VOA database of all domestic properties in England and Wales and details estimated consumption by property and household characteristics. The EPC and energy usage data covers just over 14.5 million, or around 60 per cent, of the households in England and Wales. The VOA explains that "around a third of domestic properties in England and Wales do not have an EPC rating, such as owner-occupied properties which have not been sold since EPC ratings came into use." [11]

Minimum Energy Efficiency Standards (MEES)

Source: National Energy Efficiency Data-Framework (NEED): consumption data tables 2024, DESNZ, 27 June 2024

The latest data from 2022 was used.

In 2030, the government is consulting on regulation that will require that privately rented properties have an EPC band rating of C or above. It is

proposed that landlords should be required to invest up to a maximum of £15,000 per property on improvements to meet the standard. Given that government modelling indicates that, on average, properties will require between £6,100 and £6,800 worth of investment, for the model it was assumed that all privately rented properties with an EPC band rating of D or below could be upgraded to an EPC band C.[12]

Upgrading to an EPC C should result in less gas and electricity needing to be consumed. To estimate the impact upgrades would have on energy usage, and, therefore, bills, the percentage differences in the gas and electricity used between households on EPC bands D,E,F,G and EPC C were calculated. This difference was then applied to properties' estimated current energy consumption, and energy and cost savings were estimated.

At the time of publication, there is also a government consultation ongoing to introduce similar regulation for social rented properties.[13] This was modelled in the same way for social rented properties.

Comment on fuel poverty numbers

Our model estimates that around 6.7 million households in England and Wales are paying ten per cent of their income after housing costs on domestic energy, compared to the most recently reported government figure of 9.0 million households in 2024.[14]

The difference is due our model using datasets from 2022 and 2023. These are the most recent datasets available at the time of analysis. Fuel poverty in 2022 affected 6.66 million households, and 8.73 million in 2023.[15]

Due to the statistical difference, we report on the percentage of households that can be lifted out of fuel poverty rather than the absolute number.

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Endnotes

[1] Department for Levelling Up, Housing and Communities, December 2024, *English Housing Survey 2022 to 2023 headline report,* 'chapter 1: Profile of households and dwellings', available at: www.gov.uk/government/statistics/chapters-for-english-housing-survey-2022-to-2023-headline-report/chapter-1-profile-of-households-and-dwellings, (accessed: 13 August 2025)

[2] National Records of Scotland, June 2024, 'Households and dwellings in Scotland, 2023', available at: www.nrscotland.gov.uk/publications/households-and-dwellings-in-scotland-2023/, (accessed: 13 August 2025)

[3] Welsh Government, December 2024, 'Household estimates, mid-2012 to mid-2023', available at: www.gov.wales/household-estimates-mid-2012-mid-2023-html, (accessed: 13 August 2025)

[4] Northern Ireland Statistics and Research Agency, December 2023, 'Northern Ireland Housing Statistics 2022–2023', available at: datavis.nisra.gov.uk/communities/northern-ireland-housing-statistics-2022-2023.html, (accessed: 13 August 2025).

[5] Gov.uk, March 2025, 'Annual fuel poverty statistics in England, 2025 (2024 data)'

[6] Ofgem, 'Get energy price cap standing charges and unit rates by region', available at: www.ofgem.gov.uk/get-energy-price-cap-standing-charges-and-unit-rates-region, (accessed: 13 August 2025)

[7] Cornwall Insight, 2023, *Great Britain Power Market Outlook to 2030*. Available at: https://www.cornwall-insight.com/files/cornwall-insight-gb-power-market-outlook-to-2030-q4-2023-5af6d256.pdf (Accessed: 13 August 2025)

[8] Department for Energy Security and Net Zer0 (DESNZ), April 2025, *Expanding the Warm Home Discount Scheme 2025 to 2026: Impact assessment*. Available at: assets.publishing.service.gov.uk/media/68529908ff16d05c5e6aa678/expanding-the-warm-home-discount-scheme-2025-to-2026-impact-assessment.pdf, point 26, p. 8, (accessed: 13 August 2025).

[9] Eurostat, 'Glossary: equivalised disposable income', available at: ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Equivalised_disposable_income, (accessed: 13 August 2025).

[10] DESNZ, 26 June 2025, 'National Energy Efficiency Data-Framework (NEED): Summary of Analysis, Great Britain, 2025', available at: assets.publishing.service.gov.uk/media/685bf0d30433072fce0e1000/need-report-june-2025.pdf

[11] DESNZ, 26 June 2025, 'National Energy Efficiency Data-Framework (NEED): Summary of Analysis, Great Britain, 2025', available at: assets.publishing.service.gov.uk/media/685bf0d30433072fce0e1000/need-report-june-2025.pdf

[12] DESNZ, February 2025, 'Improving the energy performance of privately rented homes: 2025 update', available at: www.gov.uk/government/consultations/improving-the-energy-performance-of-privately-rented-homes-2025-update, (accessed: 13 August 2025)

[13] DESNZ, July 2025, 'Improving the energy efficiency of socially rented homes in England', available at: www.gov.uk/government/consultations/improving-the-energy-efficiency-of-socially-rented-homes-in-england, (accessed: 13 August 2025)

[14] DESNZ, March 2025, 'Annual Fuel Poverty Statistics in England, 2025 (2024 data)', available at: assets.publishing.service.gov.uk/media/67e51e2cbb6002588a90d5d5/annual-fuel-poverty-statistics-report-2025.pdf, (accessed: 20 August 2025)

[15] DESNZ, February 2024, 'Annual fuel poverty statistics in England, 2024 (2023 data)', available at: assets.publishing.service.gov.uk/media/65ccecba1d939500129466a9/annual-fuel-poverty-statistics-report-2024.pdf, (accessed: 20 August 2025)