



Llywodraeth Cymru
Welsh Government

STATISTICS

Fuel poverty modelled estimates for Wales (headline results): as at October 2021

This short report gives modelled estimates on the number of households that were unable to afford to keep their home adequately heated as at October 2021.

First published: 13 April 2022

Last updated: 13 April 2022

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Introduction

These headline figures are being published ahead of detailed analysis, to meet user need/interest. Detailed analysis will be published in late spring. This will be accompanied by a detailed methodology report. Due to differences in methodology, the 2021 modelled estimates of fuel poverty cannot be directly

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compared with previous figures.

Background information

The Welsh Government committed to undertake a periodic biennial review of the [plan to tackle fuel poverty 2021 to 2035](#). The plan was published in March 2021, with the first review to be published in March 2023. The 2021 modelled estimates of fuel poverty were commissioned from the Building Research Establishment (BRE) to inform the first review and to assist in the preparation of interim targets to be added into the plan. These high level results are being published for transparency purposes.

Methodology

Fuel poverty estimates for Wales have been re-calculated by BRE to the October 2021 position, using the Welsh Housing Conditions Survey 2017-18 base data and modelling changes to household incomes and fuel prices between 2017 and October 2021. October 2021 was chosen as the reference point, as this is the mid-point of a typical survey year. Energy efficiency improvements to homes have been applied in line with the measures likely to have been installed in the housing stock during that time [\[footnote 1\]](#), while the impact of coronavirus (COVID-19) has been investigated by adjusting the heating regime of households with adults who were allocated a 'working from home' status. The 2021 figures have been calculated under the full income definition [\[footnote 2\]](#) and household energy requirements were modelled using the Building Research Establishment Domestic Energy Model (BREDEM 2012 version 1.1).

Definitions

A household is regarded as being in fuel poverty if they are unable to keep their

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home warm at a reasonable cost. In Wales, this is measured as any household that would have to spend more than 10% of their income on maintaining a satisfactory heating regime ^[footnote 3]. Any household having to spend more than 20% is defined as being in severe fuel poverty. A household needing to spend between 8 and 10% is classed as being at risk of fuel poverty (i.e. they are susceptible to relatively small changes in income or energy costs).

Vulnerable households are defined as those with a person aged 60 years or over, a dependent child or children under the age of 16 years, a single person under 25 and/or a person living with a long term illness or who is disabled.

A lower income household is defined as one whose income is less than 60% of the median household income in the UK before housing costs as published annually in the HBAI report ^[footnote 4].

Main results

- 196,000 households in Wales were estimated to be living in fuel poverty, equivalent to 14% of households.
- 38,000 households were estimated to be living in severe fuel poverty, equivalent to 3% of households.
- 153,000 households were estimated to be at risk of fuel poverty, equivalent to 11% of households.
- 169,000 vulnerable households in Wales were estimated to be living in fuel poverty, equivalent to 14% of vulnerable households.
- 26,000 vulnerable households were estimated to be living in severe fuel poverty, equivalent to 2% of vulnerable households.
- 141,000 vulnerable households were estimated to be at risk of fuel poverty, equivalent to 12% of vulnerable households.
- 130,000 lower income households in Wales were estimated to be living in fuel poverty, equivalent to 59% of all lower income households.
- 34,000 lower income households were estimated to be living in severe fuel poverty, equivalent to 16% of lower income households.
- 58,000 lower income households were estimated to be at risk of fuel poverty, equivalent to 26% of lower income households.

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Impact of COVID-19 on levels of fuel poverty

To reflect the increase in home working since the start of the COVID-19 pandemic, a random selection of employed adults in the Welsh Housing Conditions Survey 2017-18 dataset were assigned a 'working from home' status to bridge the gap between pre-pandemic home working levels and home working in October 2021. Data on the number of people working at home was sourced from the Understanding Society study ^[footnote 5] In total, 19% of employed adults were allocated to be home working, and non-vulnerable households with someone 'working from home' were assigned a full heating regime (16 hours of heating), with required temperatures of 21°C in the living room.

Based on this analysis, households with additional people working from home due to the COVID-19 pandemic had higher incomes (median £38,800) compared with households with no additional people working from home (median £23,400). This reflects the difference in household income by employment status. Households where the respondent was employed had higher incomes (median £37,100) compared with households where the respondent was economically inactive or unemployed (median £18,700)

The addition of home workers to account for the COVID-19 pandemic and resultant increase in home working had no impact on the number of households in fuel poverty which remained at 196,000 (14%). Less than 500 households were added to the severe fuel poverty category (2.7% to 2.8%) and there was a slight increase in the number of households at risk of fuel poverty 151,000 (10.9%) to 153,000 (11.1%).

Potential impact of 2022 fuel price increase

The increase in the domestic energy price cap announced by Ofgem on 3 February means that typical average dual fuel energy bills increased on 1 April 2022 by almost £700 a year, a 54% increase ^[footnote 6]. On this basis, the 2021 modelled estimates for fuel poverty have been used to predict the likely impact

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this latest price increase will have on households in Wales.

Other determinants of fuel poverty, such as improvements in domestic energy efficiency and household incomes are based on data as at October 2021 but fuel prices were amended to reflect changes to electricity and mains gas ^[footnote 7], and projections for estimates of heating oil prices, adjusted for inflation ^[footnote 8]. As a result of the 2022 fuel prices, the increase in median energy bills for each fuel were: 48% for electricity; 109% for gas; and 6% for heating oil. This approach over-estimates the numbers predicted to be in fuel poverty as it assumes all households are on the price cap ^[footnote 9], but it does provide an indication of the potential impact of fuel price rises on households using the Welsh measure of fuel poverty. In addition, this approach does not take account of UK and Welsh Government financial support provided through the **Winter Fuel support scheme**, **Warm Homes Discount (UK Government)** and other schemes in Winter 2021/2022 and that announced for later in 2022.

Taking the 2021 modelled estimates of fuel poverty, revising them using fuel prices (electricity, mains gas, and heating oil) from 1 April 2022, and assuming all households are on the price cap:

- up to 45% (614,000) of households could be in fuel poverty following the price cap increase of April 2022
- up to 8% (115,000) of households could be in severe fuel poverty following the price cap increase of April 2022
- up to 15% (201,000) of households could be at risk of falling into fuel poverty following the price cap increase of April 2022

The potential impact of the 2022 fuel price rises on vulnerable households are predicted to be similar to those of all households, as above.

Energy price rises are likely to hit lower income households disproportionately, as they spend a higher proportion of their income on utility bills. So for households on lower incomes there could be significant increases with up to 217,700 (98%) predicted to be in fuel poverty following the price cap increase of April 2022 and up to 91,700 (41%) predicted to be in severe fuel poverty. The remaining households on low incomes are all potentially at risk of fuel poverty

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(3,500, 2%).

Next steps

Detailed analysis of these modelled estimates are due in late spring. The intention is to cover:

- comparisons with other UK Nations
- changes over time
- fuel poverty by household characteristics
- fuel poverty by dwelling characteristics
- a more detailed discussion on the factors influencing fuel poverty; income, fuel prices and energy efficiency, and how these have changed since the previous estimates were produced

Appendix A: summary of methodology

Below is a brief summary containing descriptions of the methodology used to calculate the 2021 modelled estimates of fuel poverty figures for Wales under the 10% definition. A full methodology report will be published alongside detailed analysis in late spring.

Definitions

A household is defined as being fuel poor if they spent more than 10% of their income on fuel. This is calculated using the equation below:

$$\text{Fuel Poverty} = \frac{\text{Fuel Costs}}{\text{Income}}$$

If the ratio from the above equation is greater than 0.1, the household is defined

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as fuel poor. The total fuel costs for a household are modelled using standard heating regimes that consider how much money the household would be required to spend on fuel costs in order to reach the established standards for comfort based on a satisfactory heating regime. A 'Satisfactory heating regime' is 23°C in the living room and 18°C in other rooms, required for 16 hours in a 24-hour period in households with older (a person aged 60 and over) or disabled (a person living with a long-term limiting illness or who is disabled) people. For all other households, 21°C in the living room and 18°C in other rooms is required for nine hours in every 24-hour period on weekdays, and 16 hours in a 24-hour period on weekends.

Any household having to spend more than 20% is defined as being in severe fuel poverty.

A household needing to spend between 8 and 10% is classed as being at risk of fuel poverty (i.e. they are susceptible to relatively small changes in income or energy costs).

Calculating the main components of fuel poverty

There are three main components used to calculate fuel poverty: income, energy prices and energy requirements. Below is a summary of how these components are calculated.

Income

Two different definitions of income are required.

Basic income

This is calculated by totalling the personal incomes of everyone in the household (aged 16 and over), plus any benefit or other income source payments that the household receives (from earned income, state benefits and savings etc.) to provide the Primary Benefit Unit (PBU) income. Income from other benefit units

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and the Winter Fuel Payment (WFP) if applicable is then added to give the 'basic income'.

Full income

This is built upon 'basic income' by the addition of housing related income, including: housing related benefits (HB), Council Tax Benefit (CTB), and the deduction of Council Tax payable. This is the 'Full household income'.

Energy prices

The fuel price element of fuel poverty calculation produces fuel prices which can readily be combined with household energy requirement outputs to produce fuel costs.

The National Survey for Wales collects information of the method of payments of gas and electricity, but does not collect information on the exact tariff or supplier. Department of Business Energy and Industrial Strategy (BEIS) data sources provides gas and electricity 'average unit price' and 'average fixed costs' (standing charges) for energy supply regions across the UK. The combination of data collected by the National Survey for Wales, and the Quarterly Energy Prices^[footnote 10] publication provided by BEIS are then combined calculate a final fuel price figure. Other data for non-metered fuels is provided from Consumer Price Index (CPI) data, and for a few rare fuels from the Sutherland Tables publication or SAP default values.

Energy requirements

The amount of fuel required to provide the energy needs of each household is one of the components of fuel poverty and, combined with fuel prices, produces the modelled fuel bill.

Under the fuel poverty definition, the energy required to heat and power a home can be grouped into four categories:

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1. Space heating: E_s (GJ)
2. Water heating: E_w (GJ)
3. Lights and appliances: E_{LA} (GJ)
4. Cooking: E_c (GJ)

The Building Research Establishment Domestic Energy Model (BREDEM) methodology^[footnote 11] is used to predict the energy requirements of a household where:

$$\text{Total household energy requirements} = E_s + E_w + E_{LA} + E_c$$

Total household energy requirements include space and water heating (to meet defined standards), energy for lights and appliances (including requirements for pumps, fans and electric showers, and energy generated by renewables), and energy for cooking. The amount of energy required to heat a dwelling will depend on the building specification such as insulation levels, heating systems, the geographical location of the dwelling, and construction type. A household's demand for energy will depend on the number of people within the household and the lifestyle and habits of these individuals. Information from the National Survey for Wales and the Welsh Housing Conditions Survey are used to provide details about both dwellings and households. Reduced Data SAP (RdSAP) assumptions are used to deal with missing data and can be found in the SAP procedure document^[footnote 12]. It should be noted that the figures now incorporate the revised U-values as published in RdSAP v9.93.

Data on the occupancy characteristics, and region, are provided by the National Survey for Wales. The Welsh Housing Conditions Survey then provides information about the physical characteristics of the home, which are used to inform the modelling of household energy use for fuel poverty, including:

- detailed information about the dimensions
- dwelling type and age
- heating and hot water systems
- dwelling fabric and exposure/shading
- energy efficiency measures

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Footnotes

[1] Based on trends from previous Welsh Housing Condition Surveys, data from the English Housing Survey, solar PV deployment data, and information on UK Government schemes such as ECO and the Renewable Heat Incentive.

[2] See Appendix A of [Fuel poverty estimates for Wales: 2018](#).

[3] A 'Satisfactory heating regime' is 23°C in the living room and 18°C in other rooms, required for 16 hours in a 24-hour period in households with older (a person aged 60 and over) or disabled (a person living with a long-term limiting illness or who is disabled) people. For all other households, 21°C in the living room and 18°C in other rooms is required for nine hours in every 24-hour period on weekdays, and 16 hours in a 24-hour period on weekends. [Tackling fuel poverty 2021 to 2035](#)

[4] [Households below average income \(HBAI\) statistics \(UK Government\)](#). A household is said to be in relative low income if their net equivalised household income is below a threshold set at 60% of the average (median) UK household income.

[5] Weighted estimates of employee's who were often or always working at home (variable 'wah') were calculated from the baseline pre-COVID point in January/February 2020, and then again in September 2021. [COVID-19 \(Understanding Society\)](#)

[6] [Price cap to increase by £693 from April \(Ofgem\)](#)

[7] [Default tariff cap level: 1 April 2022 to 30 September 2022 \(Ofgem\)](#)

[8] [Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal \(Department for Business, Energy & Industrial Strategy\)](#)

[9] Ofgem estimates that 22 million households (8 in 10 households) in the UK are on a supplier's standard 'default' tariff which are protected by the energy

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price cap and therefore will be affected by the price cap rise. [Check if the energy price cap affects you \(Ofgem\)](#)

[10] The metered fuel price data used in the fuel poverty calculations are derived from the BEIS quarterly energy prices, in tables QEP 2.2.4 and QEP 2.3.4

[11] The BREDEM methodology used is described in Henderson J, Hart J, BREDEM 2012 A technical description of the BRE Domestic Energy Model, v1.1, January 2015.

[12] BRE 2017. Appendix S: Reduced Data SAP for existing dwellings, RdSAP 2012 v9.93.

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