



Fuel poverty and data infrastructure

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Open Data Institute

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About

This report is the result of joint research carried out by the Open Data Institute (ODI) with [Frontier Economics](#) and [Mime](#) published in November 2022. If you want to share feedback by email or would like to get in touch, contact charlotte.mcleod@theodi.org. This work was designed by the ODI, and project-managed by strategic communications agency, [Allegory](#).

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Executive summary

The cost of living has been increasing in England since early 2021. In September 2022, inflation was 10.1%, close to a 40-year high, and rising energy prices are a major direct and indirect contributor to this.¹ The government's recent Energy Price Guarantee will temporarily fix rates for domestic customers, but a typical household will still face energy costs more than twice the level seen in 2021. This means that it is likely many more households will struggle to heat their homes this year relative to the recent past.² Fuel poverty occurs when a household is unable to afford to heat their home to an adequate temperature.³ Fuel poverty causes considerable financial hardship and negative health impacts.⁴ On average, historically, approximately 10% of excess winter deaths are directly attributable to fuel poverty in a typical year.⁵

This report concerns itself with data infrastructure (data assets supported by people, processes and technology) and data practices in the context of fuel poverty in England. The collection and publication of fuel poverty statistics is not uniform across the four nations of the UK. Therefore, due to data availability, our data analysis has focused on England only.

The importance of using data to tackle fuel poverty has been highlighted previously⁶ and merits further in-depth exploration considering the recent energy price rises. We set out to explore the contribution that the Open Data Institute (ODI) could make in this context as an expert voice in key aspects of data infrastructure development.

Efforts to address fuel poverty in an efficient and targeted way will be made far easier if effective data infrastructure enables the right information to be collected, used and shared. Effective data infrastructure for fuel poverty would help to systematically identify those who are most in need (eg those experiencing the most acute levels of fuel poverty). It would also enable support to be well targeted by government, charities and other service delivery organisations.

¹ ONS (2022), 'Consumer price inflation, UK: September 2022%', <https://www.ons.gov.uk/economy/inflationandpriceindices/bulletins/consumerpriceinflation/september2022>

² BRE Group (2022), 'As energy bills rise, how can we tackle fuel poverty in the UK?', <https://bregroup.com/insights/as-energy-bills-rise-how-can-we-tackle-fuel-poverty-in-the-uk/>

³ End Fuel Poverty Coalition, 'About fuel poverty', <https://www.endfuelpoverty.org.uk/about-fuel-poverty/>

⁴ Hills Fuel Poverty Review (2012), 'Getting the measure of fuel poverty', https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48297/4662-getting-measure-fuel-pov-final-hills-rpt.pdf

⁵ The Health Foundation (2022), 'Failure to act on cost of living risks another health crisis', <https://www.health.org.uk/news-and-comment/news/failure-to-act-on-cost-of-living-risks-another-health-crisis>

Public Health England (2014), 'Fuel poverty and cold home related health problems', https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/355790/Briefing7_Fuel_poverty_health_inequalities.pdf

⁶ See for example, Deloitte LLP (2020), 'Better use of data and advanced statistics / machine learning in delivering benefits to the fuel poor', <https://www.gov.uk/government/publications/better-use-of-data-and-ai-in-delivering-benefits-to-the-fuel-poor-research-report-and-cfps-recommendations>

The aims of this research are to:

- **Explore** the current data and underlying data infrastructure that exists in relation to fuel poverty. Consider what insights can be drawn from bringing together a range of existing datasets for the first time, including what gaps may currently exist.
- **Create new insights** by carrying out value-adding analysis and creating an updated fuel poverty risk index. This will improve understanding of current fuel poverty patterns and aid efforts to target resources to where they are most needed.
- **Encourage** other stakeholders to undertake follow-up actions that have a meaningful impact on tackling fuel poverty.

The analysis in this report brings together a unique combination of existing datasets to provide a data-informed picture of fuel poverty and at-risk groups.

These sources of data include:

- nationally representative household surveys on prevalence of fuel poverty and the size of the fuel poverty gap
- administrative data on who receives specific types of government support
- data on the drivers of fuel poverty such as energy efficiency ratings of dwellings.

In line with the objectives of this study, we have also considered what the current infrastructure looks like in this context and highlight where there are gaps. Finally, we have created an updated and extended fuel poverty risk index which provides insights on the scale of fuel poverty in local areas and the extent to which support schemes are well targeted. This risk index will be updated in the future to highlight changes in the pattern of fuel poverty.

As noted above, due to data availability we have focused solely on English fuel poverty throughout this study. The lack of a consistent set of indicators on fuel poverty across all four nations of the UK is an important data gap which warrants further attention as part of future work.

Findings

Current challenge

In England, the government introduced a new definition of fuel poverty in 2021. This is known as the ‘Low Income Low Energy Efficiency’ (LILEE) definition. Under this definition, a household is fuel poor if they are living in a property with an energy efficiency rating of D, E or F, and their disposable income (after housing costs and energy needs) is below the poverty line. On average, 13% of English households were classed as fuel poor using data collected in 2020.⁷ This equates to 3.16 million households. The recent rises in energy prices mean that many more households will struggle to pay for fuel this winter.⁸ A wider group of household types are also now at risk of fuel poverty. For example, our analysis shows that the proportion of fuel poor households containing someone at work has risen steadily. This group accounted for 38% of all fuel poor households in 2010 and 48% of all fuel poor households in 2020.

The prevalence of fuel poverty varies across England. This variation is driven by individual households’ socio-economic characteristics as well as geographic differences in the energy efficiency of housing stock and different climate patterns (eg average winter temperatures are lower in the north of England). This variation matters as it will affect how well current support initiatives are targeted towards those most in need. For example, our analysis shows that 25% of households that are privately renting their property are estimated to be in fuel poverty and 27% of households containing more than five residents are estimated to be in fuel poverty. These proportions are approximately double the English average.⁹

We can also explore regional differences in the proportion of households that are classed as living in fuel poverty. The West Midlands and Yorkshire and the Humber contain the highest proportion of households in fuel poverty (17.8% and 17.5% respectively). London and the south of England have lower rates (all below 12%).

To fully understand fuel poverty, it is important to distinguish between *prevalence* and *scale* of need. The scale of each household’s need is measured by the **fuel poverty gap**; defined as the reduction in fuel costs needed for a household currently in fuel poverty to not be in fuel poverty. On average, the proportion of households in fuel poverty in urban areas is approximately equal to the proportion of households in fuel poverty in rural areas. However, those households that are fuel poor in rural areas require a larger reduction in fuel costs to escape fuel poverty (compared to fuel poor urban households). Therefore, the average **fuel poverty gap** is larger among fuel poor rural households even if the **prevalence of fuel poverty** is equal to that of other groups. Granular data which is not currently publicly available is needed to explore these nuances.

⁷ BEIS (2022), ‘Fuel Poverty Statistics’,

<https://www.gov.uk/government/collections/fuel-poverty-statistics>

⁸ Resolution Foundation (2022), ‘Cutting back to keep warm’,

<https://www.resolutionfoundation.org/press-releases/low-income-households-will-have-to-cut-back-on-spending-by-three-times-as-much-as-high-income-households-this-winter/>

⁹ BEIS (2022), ‘Annual Fuel Poverty Statistics in England’,

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1056777/annual-fuel-poverty-statistics-lilee-report-2022-2020-data.pdf

Current data and data infrastructure limitations

To adequately account for the complexity and nuances associated with fuel poverty issues, the data infrastructure for fuel poverty needs to improve.

- 1. The government's definition of fuel poverty and the resulting number of households identified as fuel poor within national statistics is relatively narrow.** The current definition of fuel poverty in England excludes any household in a relatively fuel-efficient property,¹⁰ regardless of their income or the level of energy prices. This could potentially mean that we are not counting many households who are struggling financially to heat their homes. Consideration of a wider suite of household and local area fuel poverty metrics will help ensure that the full scale of fuel poverty is being recognised.
- 2. Current official indicators are already out of date and do not reflect the reality of a fast-evolving situation.** Official English fuel poverty data is based on information collected in 2020. Collection and sharing of recent data would allow for the current challenge to be tracked in a more timely way.
- 3. Official fuel poverty statistics are currently solely based on a single survey which does not have sufficient statistical power to enable in-depth granular exploration of specific household types.** Creation of granular data assets which allow in-depth exploration of fuel poverty among specific subgroups and small geographies is needed. This information can in turn inform actual decisions made by policymakers and charities. For example, it is expected that the Energy Price Guarantee will be restricted to vulnerable groups after April 2023. Details on how exactly this restricted support will be targeted are not yet available. It is vitally important that the targeting mechanism used post-April 2023 is accurate and reflects the nuances of current fuel poverty challenges to support those households with the greatest need.
- 4. Multiple government support schemes exist to combat fuel poverty. However, data on the extent to which these schemes successfully target those most in need is only published on a scheme-by-scheme basis** (if at all). Better data infrastructure is needed to facilitate an overall holistic analysis. Publishing in a single location the schemes' beneficiaries would increase transparency and would allow for explicit exploration of the success and limitations of current support schemes in targeting the fuel poor.

Fuel poverty risk index

To begin addressing some of the issues above we created an updated **fuel poverty risk index** that begins to overcome them and fills existing gaps. The goal of our index is to provide a more nuanced picture of fuel poverty risks for households living in each English local authority than currently exists. In particular,

¹⁰ Properties with an energy efficiency rating of C or better. GOV.UK, 'Energy Performance Certificates', <https://www.gov.uk/buy-sell-your-home/energy-performance-certificates>

our index:

- draws on interrelated factors (such as climate, income, deprivation and housing stock) that could drive rates of fuel poverty (addressing issue #1); bringing data together in this way can provide higher quality insights and allow for better decisions
- makes use of the most up-to-date as possible set of indicators (partially addressing issue #2)
- provides an indicator of fuel poverty risks within relatively small geographic areas (partially addressing issue #3)
- compares fuel poverty risk to the level of support provided to that locality (addressing issue #4).

Our fuel poverty risk index is divided into two primary domains:

- local area **demand for fuel** (based on metrics such as housing quality and climate patterns)
- local area **ability to pay for fuel** (based on income and deprivation metrics).

We also combined the results from these two separate domains to create an overall index risk score for each local authority in England, which provides a holistic indication of fuel poverty. The heatmap presented below shows variation in fuel poverty risk across England at the local authority level. Overall, households living in the North East, North West and Yorkshire and the Humber have the highest potential for fuel poverty, relative to the rest of England.

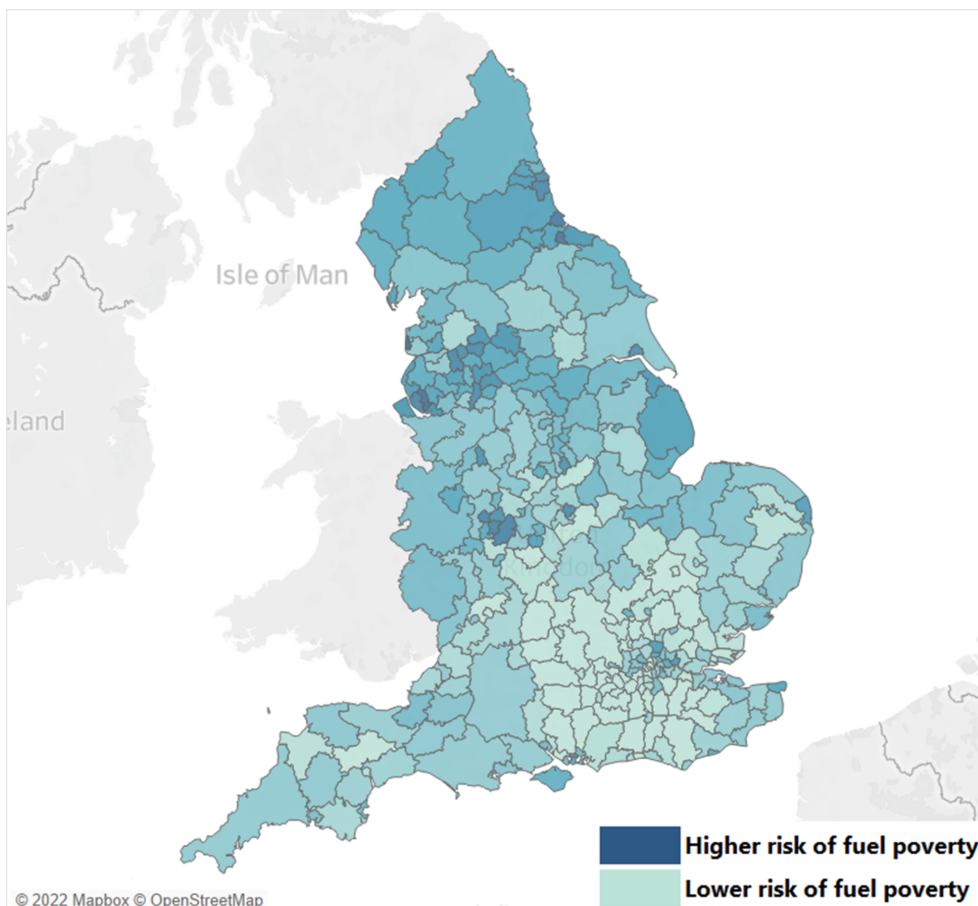


Figure 1: Geographical variation in potential for fuel poverty

Households living in Blackpool have the highest potential for fuel poverty based on our aggregate metric. This is because households in that area tend to have below average incomes (incomes in Blackpool are 27% below the English average) and are more likely to be in receipt of Universal Credit (15% in Blackpool versus 8% nationally). In addition, 73% of dwellings in Blackpool are classed as energy inefficient (below EPC Band C), which is worse than the national average (68%).

To better understand the extent to which current support is targeted at those most in need, we also produced a local authority support score which represents the level of fuel poverty support that the government is providing in a specific local area (this support consists of Winter Fuel Payments, Green Homes Grants, Eco Flex payments and Household Support Grant Funding). Comparing this score to the overall fuel poverty risk is valuable when trying to identify areas which may be in need of further support.

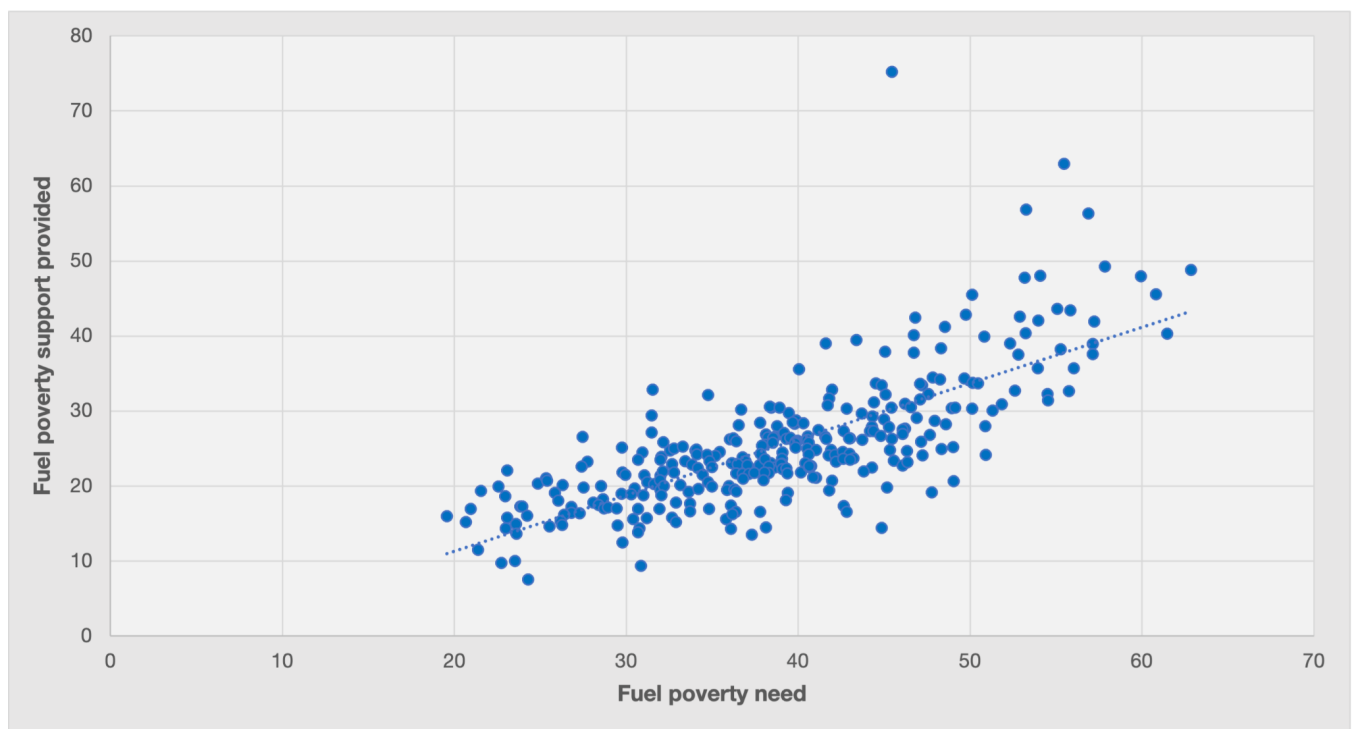


Figure 2: Correlation between fuel poverty need and fuel poverty support provided

Overall, we observe a statistically significant positive correlation between level of support provided and overall risk of fuel poverty within each local authority. This suggests that, on average, government fuel poverty support is more likely to go to households living in local authorities with an above average demand for fuel and a below average ability to pay.

However, we can also see that there is significant room for improvement. In particular, multiple local authorities in both urban and rural areas appear to not be receiving an appropriate allocation of government support. There are several local authorities which stand out as apparent outliers. For example, households in areas such as Hackney (London), Barrow-in-Furness (North West) and Lincoln (East Midlands) all receive relatively low levels of support given their risk of fuel poverty.

These discrepancies are driven by a range of factors. For example, some fuel

poverty support mechanisms rely on receipt of benefits to identify fuel poor households, despite the fact that this is an imperfect proxy for need. This is because almost half of fuel poor households (46%) were not in receipt of qualifying benefits in 2021. Secondly, it is not known whether households in receipt of benefits had high heating costs.¹¹

In other cases, households with the greatest need may not be fully aware of the support that is offered, which means they do not receive the help they are entitled to. Finally, the eligibility criteria for certain support mechanisms (eg Winter Fuel Payments) are not based on ability to pay or demand for fuel, which will limit their ability to target the fuel poor.

It is worth carefully considering whether households in areas which currently seem to be under supported should receive additional help.

Future work

Policymakers, government agencies and other organisations who provide support for those experiencing fuel poverty can use the insights contained in this report to inform design of future household support initiatives. Furthermore, we have published our local area fuel poverty risk index and supporting dataset alongside this report. This can be used to understand fuel poverty in detail within any local authority across England.

The ODI has also committed to updating the fuel poverty risk index in 2023. We want to ensure that the next iteration of the fuel poverty risk index that we produce builds on this year's index and adds further value. This could include:

- including insights from individuals who are currently experiencing fuel poverty on what additional factors might provide an indication of unmet need
- adding a wider set of indicators to our aggregate fuel poverty risk measure, for example including input from a range of stakeholders such as charitable groups who provide services across the country could strengthen our understanding of local patterns of need
- analysing how targeting of publicly provided support has changed over time in the face of the worsening cost of living crisis
- broadening the geographic scope of the index beyond England
- considering impacts on non-domestic energy customers as well as households.

¹¹ Committee on Fuel Poverty (2021), 'Annual Report', <https://www.gov.uk/government/publications/committee-on-fuel-poverty-annual-report-2021>

1. Background and introduction

In this section we set out what we mean by fuel poverty and its supporting data infrastructure.

What is fuel poverty?

What do we mean by fuel poverty?

Fuel poverty is the condition by which a household is unable to afford to heat (or cool) their home to an adequate temperature.¹² There are three primary drivers of fuel poverty:¹³

- **Income.** Households living on a low income are more likely to experience financial difficulties when heating their home.
- **Unit costs of fuel.** All else being equal, more expensive energy prices (including gas, electricity and heating oil) will mean that more households find heating their homes to be a challenge.
- **Household energy consumption.** Households living in energy inefficient properties will have to use more energy on average to keep their homes at an adequate temperature. This higher-than-average consumption may lead to fuel poverty in some cases (for a given level of income and/or fuel price).

Previous in-depth examinations of fuel poverty have concluded that fuel poverty is a distinct problem rather than a manifestation of more general problems of poverty.¹⁴ This is because:

- fuel costs could in many cases be largely outside the control of households (given the capital investment that would be required to reduce them)
- fuel poverty has direct health and wellbeing impacts (living at low temperatures as a result of fuel poverty is a contributor to excess winter deaths).¹⁵

In England, the government introduced a new definition of fuel poverty in 2021. This is known as the ‘Low Income Low Energy Efficiency’ (LILEE) definition. Under this definition, a household is fuel poor if they are living in a property with an

¹² End Fuel Poverty Coalition, ‘About fuel poverty’, <https://www.endfuelpoverty.org.uk/about-fuel-poverty/>

¹³ House of Commons Library (2022), ‘Fuel poverty in the UK’, <https://commonslibrary.parliament.uk/research-briefings/cbp-8730/>

¹⁴ Hills Fuel Poverty Review (2012), ‘Getting the measure of fuel poverty’, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48297/4662-getting-measure-fuel-pov-final-hills-rpt.pdf

¹⁵ The Health Foundation (2022), ‘Failure to act on cost of living risks another health crisis’, <https://www.health.org.uk/news-and-comment/news/failure-to-act-on-cost-of-living-risks-another-health-crisis>

Public Health England (2014), ‘Fuel poverty and cold home related health problems’, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/355790/Briefing7_Fuel_poverty_health_inequalities.pdf

energy efficiency rating¹⁶ of D, E or F, and their disposable income (after housing costs and energy needs) is below the poverty line. This implies that any household in a property with an energy efficiency rating of C or better (48% of dwellings in 2019/20) cannot be defined as being in fuel poverty (regardless of their income or the level of energy prices). We examine this group in more detail in subsequent sections of this report.

In the latest year for which statistics are available (2020), an estimated 3.16 million households in England were defined as fuel poor under the LILEE definition.¹⁷ This was 13.2% of English households.

Why is fuel poverty important today?

Fuel poverty is a major social problem, causing considerable hardship and negative health impacts. Addressing fuel poverty is also linked to efforts to reduce carbon emissions, as improving energy efficiency of the housing stock can reduce fuel costs and also lower domestic emissions.¹⁸

Access to a safe and warm home is an essential precondition for living a healthy life. Recent analysis has concluded that housing defects which expose residents to excess cold lead to negative health impacts for those residents. These health impacts (purely related to fuel poverty) in turn create annual NHS treatment costs which have been estimated at over £850 million.¹⁹ Health impacts of cold homes include increased risk of heart attack or stroke, respiratory illnesses, poor diet due to 'heat or eat' choices, mental health issues, and worsening or/slow recovery from existing conditions.²⁰ These impacts emphasise the importance of having a fuel poverty data infrastructure (see next section) which is capable of cutting across multiple sectors and incorporating a wide suite of metrics.

The UK is currently experiencing a severe cost of living crisis. In September 2022, inflation was 10.1%, close to a 40-year high, and rising energy prices are a major direct and indirect contributor to this.²¹ From July 2021 to July 2022, domestic gas prices increased by 96% and domestic electricity prices by 54%.²² This is due to an increase in global gas demand as pandemic restrictions were lifted and lower than normal production of natural gas. In addition, Russia has been reducing gas supplies to Europe over the last six months following the invasion of Ukraine.²³

¹⁶ An Energy Performance Certificate (EPC) is a rating of how energy efficient a property is. The certificates are graded on a scale of A (most efficient) to G (least efficient). An EPC is a legal requirement when a property is bought, sold or rented. GOV.UK, 'Find an energy certificate', <https://www.gov.uk/find-energy-certificate>

¹⁷ BEIS (2022), 'Fuel Poverty Statistics', <https://www.gov.uk/government/collections/fuel-poverty-statistics>

¹⁸ Hills Fuel Poverty Review (2012), 'Getting the measure of fuel poverty', https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48297/4662-getting-measure-fuel-pov-final-hills-rpt.pdf

¹⁹ BRE (2021), 'The cost of poor housing in England', <https://bregroup.com/press-releases/bre-report-finds-poor-housing-is-costing-nhs-1-4bn-a-year/>

²⁰ House of Commons Library (2022), 'Fuel poverty in the UK', <https://commonslibrary.parliament.uk/research-briefings/cbp-8730/>

²¹ ONS (2022), 'Consumer price inflation, UK: September 2022%', <https://www.ons.gov.uk/economy/inflationandpriceindices/bulletins/consumerpriceinflation/september2022>

²² House of Commons Library (2022), 'Domestic energy prices', <https://commonslibrary.parliament.uk/research-briefings/cbp-9491/>

²³ Ofgem (2022), 'Ofgem updates price cap level and tightens up rules on suppliers', <https://www.ofgem.gov.uk/publications/ofgem-updates-price-cap-level-and-tightens-rules-suppliers>

Ofgem's price cap puts a maximum per unit price on energy, which reflects what it costs to buy energy on the wholesale market and supply it to homes.²⁴

In August 2022, Ofgem announced that the energy price cap will rise to £3,549 per year for dual fuel for an average household from 1 October 2022.²⁵ The price cap averages across all households on a default energy tariff whether they pay by direct debit, standard credit or a prepayment meter. However, the underlying rates do vary by meter type and those households who pay using a prepayment meter do face higher costs on average.²⁶ This price cap rise is unprecedented over the last 18 months. Recent predictions are that this price cap could leave 8.8 million households across the UK in fuel poverty in October 2022.²⁷ The Resolution Foundation estimated that to afford the increase in energy bills in January to March 2023, the poorest fifth of households will have to cut back 24% of non-essential spending (defined as all spending except on fuel, housing, food, transport and communication).²⁸

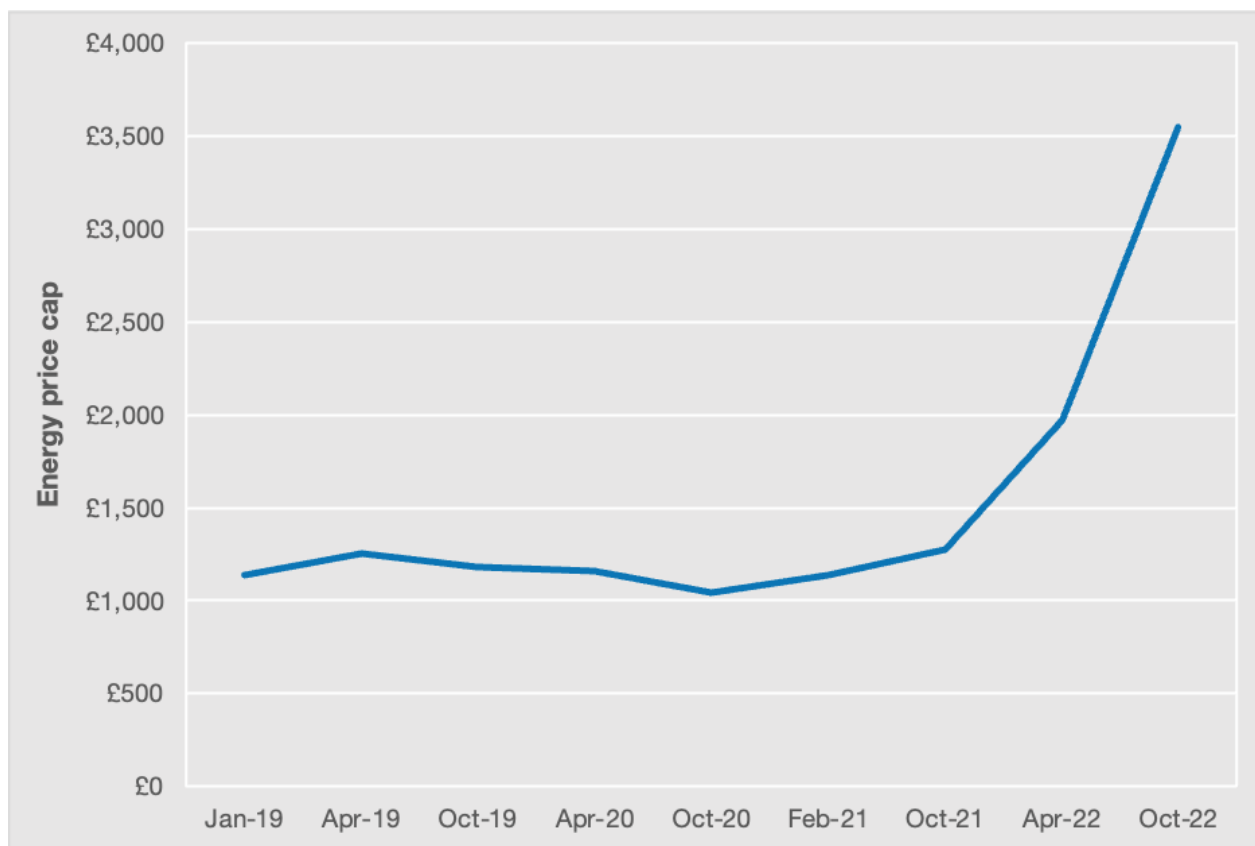


Figure 3: Ofgem energy price cap (based on typical usage on a default standard variable tariff)

²⁴ The cap sets maximum prices for a unit of energy and daily standing charges for customers in each energy supply region of Great Britain. It does not cap maximum annual bills, but reflects the amount an average household may expect to pay under the capped price per unit. Ofgem multiplies these capped unit prices for gas and electricity by 'typical' annual consumption levels and adds these to daily standing charges to arrive at an illustrative annual bill in each region. These regional levels are averaged to give the headline figure for Great Britain.

²⁵ Ofgem (2022), 'Ofgem updates price cap level and tightens up rules on suppliers', <https://www.ofgem.gov.uk/publications/ofgem-updates-price-cap-level-and-tightens-rules-suppliers>

²⁶ Ofgem (2022), 'Energy price guarantee', <https://www.ofgem.gov.uk/check-if-energy-price-cap-affects-you>

²⁷ Based on the 10% definition of fuel poverty. National Energy Action, 'Fuel poverty statistics', <https://www.nea.org.uk/energy-crisis/fuel-poverty-statistics-explainer/>

²⁸ Resolution Foundation (2022), 'Cutting back to keep warm', <https://www.resolutionfoundation.org/press-releases/low-income-households-will-have-to-cut-back-on-spending-by-three-times-as-much-as-high-income-households-this-winter/>

Before the new higher price cap took effect, the government introduced an Energy Price Guarantee which originally fixed unit rates for domestic customers at a lower level for two years. This guarantee implies that a typical household (on a dual electricity and gas bill) will pay no more than £2,500 annually for its gas and electricity bills.²⁹ A typical household on average contains 2.4 residents and uses 2,900kWh of electricity and 12,000kWh of gas in a year. Actual consumption will vary across households. For example, families living in detached houses usually need to consume more energy than those living in terraced houses and will therefore pay more. This provision of support is on top of the support announced in February 2022 (including the Energy Bill Discount Scheme³⁰ and Council Tax rebate³¹) and existing ongoing policy initiatives in this area (such as Warm Home Discount,³² Winter Fuel Payment³³ and Green Homes Grant).³⁴

The government subsequently decided that the Energy Price Guarantee would operate as universal support for six months only and will be restricted thereafter. Details on how exactly this restricted support will be targeted are not yet available. It is vitally important that the targeting mechanism used post-April 2023 is accurate and supports those households with the greatest need.

These recent initiatives clearly go some way to addressing fuel poverty and mitigating recent wholesale energy price rises. However, a price cap of £2,500 still represents a doubling of expenditure for a typical household relative to 2021 prices. This in turn will mean that many more households struggle to heat their homes this year and highlights why further exploration of this issue is so important.

The government will also provide an additional payment of £100 to households in areas of the UK that are not served by the gas grid.³⁵ This is to compensate these households for the rising costs of alternative fuels such as heating oil. These households are more likely to be in rural areas. We examine how fuel poverty affects households living in rural areas within the subsequent sections of this report.

The scope of our work in the remainder of this report is limited to households only.

What is the government trying to achieve?

The UK government and devolved administrations all recognise the importance of addressing fuel poverty and are all committed to tackling this issue.

In England, there is a statutory fuel poverty target to ensure that as many fuel poor homes as is reasonably practical achieve a minimum energy efficiency rating of C

²⁹ This cap is in addition to the previously announced £400 energy bill discount for all households.

³⁰ GOV.UK (2022), 'Getting the Energy Bills Support Scheme discount', <https://www.gov.uk/guidance/getting-the-energy-bills-support-scheme-discount>

³¹ GOV.UK (2022), 'Support for energy bills - the council tax rebate 2022-23: billing authority guidance', <https://www.gov.uk/government/publications/the-council-tax-rebate-2022-23-billing-authority-guidance/support-for-energy-bills-the-council-tax-rebate-2022-23-billing-authority-guidance>

³² GOV.UK (2022), 'Warm home discount', <https://www.gov.uk/the-warm-home-discount-scheme>

³³ GOV.UK (2022), 'Winter fuel payment', <https://www.gov.uk/winter-fuel-payment>

³⁴ GOV.UK (2022), 'Green homes grant', <https://www.gov.uk/guidance/apply-for-the-green-homes-grant-scheme>

³⁵ GOV.UK (2022), 'Energy price guarantee', <https://www.gov.uk/government/news/government-announces-energy-price-guarantee-for-families-and-businesses-while-urgently-taking-action-to-reform-broken-energy-market>

by 2030.³⁶ Data on the energy efficiency of housing in England and Wales is published annually.³⁷ In addition, two interim milestones were adopted in 2015 to ensure as many fuel poor homes as is reasonably practicable achieve a rating of E by 2020 and D by 2025. However, a lack of progress in improving the energy efficiency of the existing housing stock means that these targets may not be met. Analysis earlier this year by National Energy Action concluded that, if recent trends continue, it would take over 60 years before there are no fuel poor households living in energy inefficient homes; the government's 2030 statutory commitment.³⁸ Failure to meet these targets mean that some poor households will continue to live in energy inefficient homes beyond 2030. These households will continue to incur higher than average fuel costs as a result, which may have negative impacts on their health. National Energy Action have noted that this slow progress is due to an inadequate level of government support.³⁹

Efforts to address fuel poverty will also link to other government objectives such as achieving Net Zero by 2050.⁴⁰ The government's Net Zero Strategy includes a commitment to helping households and businesses reduce their energy bills while making buildings healthier and more comfortable. This can be achieved by rolling out energy efficiency measures that will help protect vulnerable households, while also reducing our reliance on fossil fuels and curbing emissions. Analysis by the Energy Savings Trust (EST) calculated that installation of 270mm of loft insulation (in a property that currently has none) can cost between £455 and £640. Annual household savings from this installation (in the form of lower bills) are estimated to currently be between £330 and £590 a year, according to EST.⁴¹ Therefore, this measure could pay for itself relatively quickly, even before climate impacts are taken into account.

In addition to these fuel poverty specific targets, the government also published a broader British Energy Security Strategy in April 2022.⁴² This included a plan to increase energy security via several initiatives such as improving the efficiency of homes.

³⁶ BEIS (2021), 'Sustainable Warmth',

<https://www.gov.uk/government/publications/sustainable-warmth-protecting-vulnerable-households-in-england/sustainable-warmth-protecting-vulnerable-households-in-england-accessible-web-version>

³⁷ ONS (2021), 'Energy efficiency of Housing, England and Wales, country and region', <https://www.ons.gov.uk/peoplepopulationandcommunity/housing/datasets/energyefficiencyofhousingenglandandwalescountryandregion>

³⁸ NEA (2022), 'New statistics show UK Government will take over 60 years to meet statutory fuel poverty commitments', <https://www.nea.org.uk/news/fpstats-60years-behind-target/>

³⁹ NEA (2022), 'New statistics show UK Government will take over 60 years to meet statutory fuel poverty commitments', <https://www.nea.org.uk/news/fpstats-60years-behind-target/>

⁴⁰ HM Government (2021), 'Net zero strategy', <https://www.gov.uk/government/publications/net-zero-strategy>

⁴¹ EST, (2022), 'Roof and loft insulation', <https://energysavingtrust.org.uk/advice/roof-and-loft-insulation/>

⁴² BEIS (2022), 'British energy security strategy', <https://www.gov.uk/government/publications/british-energy-security-strategy/british-energy-security-strategy>

What do we mean by data infrastructure?

Throughout this report we refer to data infrastructure and data practices in the context of fuel poverty. We use the term data infrastructure to refer to data assets (eg a dataset measuring fuel poverty amongst a specific group of households), supported by people, processes and technology:

i) Data assets

Data assets include datasets, identifiers and registers. As we will explore in subsequent sections of this report, potential data asset gaps in this context could include a lack of granular detail in datasets which aim to highlight groups at risk of fuel poverty and the use of out-of-date data assets when making policy decisions.

ii) Data standards and technologies

Data standards and technologies are used to curate and provide access to those data assets. Standards for data are reusable agreements that make it easier for people and organisations to publish, access, use and share better quality data. They are documented, reusable agreements that solve a specific set of problems or meet clearly defined needs. Standards detail the language, concepts, rules, guidance or results that have been agreed. Standards are used when it is important to be consistent, or to repeat processes, make comparisons, and reach a shared understanding. Standards are used in industries and sectors across the world to document agreements on physical items, ideas, digital products, processes, and more.

Issues in the current context could include lack of agreed standards for measuring fuel poverty across the UK's nations and the absence of consistent metrics over time.

iii) Guidance and policies

Guidance and policies inform the use and management of data assets and the data infrastructure itself. We will highlight any strengths and limitations that we identify in this regard.

iv) Organisations

Organisations govern the data infrastructure. Data governance refers to the exercise of authority, control and shared decision-making (planning, monitoring and enforcement) over the management of data assets. Potential issues to be explored in this context could include the ability of all relevant organisations (eg government departments, charities, consumer groups) to coordinate and share information on fuel poverty in a mutually beneficial way that builds trust.

v) People

People are involved in contributing to or maintaining data infrastructure, and those who are impacted by decisions that are made using it. We consider the extent to which people have the information that they need to make informed decisions in regards to fuel poverty.

What is the relevance of data infrastructure in this context?

Efforts to address fuel poverty in an efficient way will only be successful if certain preconditions are in place. A key enabler is data infrastructure. Having the appropriate data assets, processes, people and technology will help to ensure that the right information is collected, used and shared.

An effective data infrastructure related to fuel poverty would help to identify those who are in most need in a systematic way (eg those experiencing the most acute levels of fuel poverty) and could also highlight the longer-term benefits associated with adequate investment in efforts to tackle fuel poverty. In turn, this would benefit:

- **Households at risk of fuel poverty** who would be more likely to receive necessary support if the right data was collected, used and shared to identify the interventions that would be of most help.
- **The government**, which requires better data to improve the targeting and efficiency of new and existing interventions aimed at alleviating fuel poverty. Considerable public resources are dedicated to tackling fuel poverty: the Committee on Fuel Poverty (CFP), a non-departmental body that monitors and provides advice on the government's strategy to improve energy efficiency, noted in 2021 that over £2.55 billion per year of public funding is currently allocated to improving energy efficiency and assisting householders to pay their fuel bills. This figure has subsequently risen due to the introduction in 2022 of the Energy Bills Support Scheme, and is likely to rise further as a result of commitments by all major political parties to support increased funding for home insulation and other retrofit measures over the long term. It is essential that data is used to target these resources (and future support) in the most effective way possible and articulate the longer-term economic and environmental benefits of undertaking these activities.
- **Charities and service delivery organisations** that could focus their efforts on meeting the needs of those not fully supported by existing public services, as data could highlight areas not currently in receipt of sufficient support.

Previous work in this area has called on the government to make better use of data to identify where fuel poor households live and design programmes to assist fuel poor households accordingly.⁴³ The CFP has noted that successive governments have failed to maximise the use of data to help identify the location of fuel poor households and improve the targeting of available budgets on the fuel poor.⁴⁴

⁴³ Deloitte LLP (2020), 'Better use of data and advanced statistics/machine learning in delivering benefits to the fuel poor', <https://www.gov.uk/government/publications/better-use-of-data-and-ai-in-delivering-benefits-to-the-fuel-poor-research-report-and-cfps-recommendations>

⁴⁴ Committee on Fuel Poverty (2021), 'Annual Report',

Using data in this way will only be possible if an effective data infrastructure exists and stakeholders have the skills and incentives to make high-quality data available in a timely fashion and in an appropriate format that will provide insight and facilitate decision-making. For example, relevant decisions could include which groups to target when offering support and how much investment in fuel poverty support is optimal given short and long-term impacts. Within this current piece of work, we consider the current state of data infrastructure related to fuel poverty, highlight gaps that may need attention going forward and address some of these gaps via new analysis.

Report structure

- Section 2 contains additional detail on the methods that we have used, and approach undertaken.
- Section 3 outlines what we know about current variation in the prevalence of fuel poverty and specific data limitations.
- Section 4 presents insights from our newly created fuel poverty risk index.
- Section 5 summarises our conclusions regarding data infrastructure in this context.

2. Methods

This section sets out our focus for this piece of work. We also describe the methodology deployed.

What is the focus of our work?

This report draws together several data sources and existing evidence which relate to fuel poverty in England and its underlying data infrastructure (each of these sources is listed below).

The aims of this research are to:

- **Explore** the current data and underlying data infrastructure that exists in relation to fuel poverty. Consider what insights can be drawn from examining a range of existing datasets that we have brought together for the first time and what gaps may exist currently.
- **Create new insights** via new analysis that can add value in this context, improve understanding of current fuel poverty patterns and help to target resources where they are most needed.
- **Encourage** other stakeholders to undertake follow-up actions that have a meaningful impact on tackling fuel poverty.

Our analysis and the supporting local area data tool (described further below) can be used to inform both national and local interventions based on empirical evidence of need.

The societal importance of fuel poverty in the current cost of living crisis motivated this work. In addition, the importance of using data to tackle fuel poverty has been highlighted previously and therefore merited further in-depth exploration considering the recent energy price rises.⁴⁵ We wanted to look at what contribution we could make in this context, as the ODI is an expert voice in certain key aspects of data infrastructure development. This expertise includes enabling data-sharing initiatives to unlock value. These initiatives can include governance mechanisms like data institutions or standards to support the publication and use of data. Organisations like the ODI can therefore play an important role in supporting efforts to tackle fuel poverty in an effective way. The ODI has used its expertise in this context to inform the design, use and sharing of the updated fuel poverty risk index that we describe in detail below.

⁴⁵ See for example, Deloitte LLP (2020), 'Better use of data and advanced statistics/machine learning in delivering benefits to the fuel poor', <https://www.gov.uk/government/publications/better-use-of-data-and-ai-in-delivering-benefits-to-the-fuel-poor-research-report-and-cfps-recommendations>

Approach

Collection and analysis of data

This report combines data from a number of sources. The collection, analysis and visualisation of these data sources formed the cornerstone of our work. We used existing data to examine the prevalence of fuel poverty amongst different groups, draw out relevant trends over time and consider important gaps.

The table below lists each dataset we have used. We have set out the relevant category for each dataset as well as its year of publication and licence (where relevant).

| Data category | Dataset | Source | Date published | Most recent year of data | Licence |
|----------------------------|---------------------------------|--|----------------|--------------------------|--|
| Ability to pay | Ofgem historical price cap data | Default Tariff Cap | 2022 | 2022 | Open Government Licence v3.0 |
| Prevalence of fuel poverty | Fuel Poverty Trends | BEIS Fuel Poverty Statistics | 2022 | 2020 | Open Government Licence v3.0 |
| Provision of support | Green Home Vouchers | Green Homes Grant voucher release | 2022 | 2022 | Open Government Licence v3.0 |
| Provision of support | Winter Fuel Payments | Winter Fuel Payment statistics | 2022 | 2020 | Open Government Licence v3.0 |
| Impact of fuel poverty | Winter deaths | Excess winter mortality in England and Wales: 2020 to 2021 | 2022 | 2021 | Open Government Licence v3.0 |
| Fuel poverty drivers | Housing stock energy efficiency | Energy efficiency of housing in England and Wales | 2022 | 2022 | Open Government Licence v3.0 |
| Fuel poverty drivers | Dwelling condition and safety | English Housing Survey data on dwelling condition and safety | 2022 | 2020 | Open Government Licence v3.0 |

Table 1: Data sources used in this report

Section 3 of this report sets out our findings and conclusions from analysis of this data. In addition, we analysed a further 16 datasets when creating our updated fuel poverty risk index. We describe each of these datasets and the revealing metric in Section 4.

The collection and publication of fuel poverty statistics is not uniform across the four nations of the UK. Northern Ireland and Scotland are responsible for much of their own national statistics, while the Office for National Statistics (ONS) covers England and Wales. As a result, some fuel poverty indicators are not available for all four nations. In addition, support for fuel poverty and to improve the energy efficiency of homes varies across the nations. For these reasons, our data analysis has focused on England only.

Index construction

Following our analysis of the publicly available data sources listed above and consultation with expert stakeholders (see below for further details), we identified an important data gap. Specifically, no up-to-date, comprehensive data source exists which:

- provides a holistic indication of fuel poverty issues (including energy demand and ability to pay) in each of England's local authorities
- systematically correlates fuel poverty indicators with provision of public support.

To fill this gap, we have created a fuel poverty risk index which contains two subdomains covering:

- local area **demand for fuel** (based on metrics such as housing quality and climate patterns)
- local area **ability to pay for fuel** (based on income and deprivation metrics).

We suggest that this constitutes a significant improvement in understanding of fuel poverty and its multifaceted components. In this work, we have also considered the extent to which local area fuel poverty scores correlate with levels of government-provided support (via a range of policy initiatives such as Winter Fuel Payments and Green Homes Grants). This provides a verifiable and data-enabled indication of the extent to which current support schemes are well targeted. It also allows us to highlight areas of England which may need more support. This is an important contribution to the current literature and could be used to inform the alteration of existing support and/or help to design new evidence-based policies which can address this pressing issue in an efficient way. Previous work on this topic focuses on the national level; rather than digging deeper and targeting smaller geographical areas.

The index that we have created builds on previous work carried out by the End Fuel Poverty Coalition⁴⁶ and Age UK.⁴⁷ In 2021, in response to the increasing challenges around affordability of fuel, the End Fuel Poverty Coalition partnered

⁴⁶ End Fuel Poverty Coalition, <https://www.endfuelpoverty.org.uk/>

⁴⁷ Age UK, <https://www.ageuk.org.uk/>

with Age UK to produce the English Fuel Poverty Index⁴⁸ for the first time. This former iteration of the index ranks each of England's local authority districts according to the proportion of fuel poor households and distribution of policy responses.

As part of this work, we have updated the existing information included in last year's index and added significantly to the suite of metrics included (further detail is provided in Section 4). We have also broken down fuel poverty metrics into the two separate domains as described above (*demand for fuel* and *ability to pay for fuel*). To maximise the positive impact of our work, we have provided a wider variety of user-focused tools and visualisations, which ensure the insights are fully utilised (see below for further details).

In the absence of this work, last year's index would not have been updated. The ODI is sponsoring an update of the index for 2022 (and 2023) to ensure that this data can be used in the most effective way possible to inform decision-making. This will also allow for accurate tracking of patterns in fuel poverty at this important time, using a consistent set of metrics. As we describe in more detail in Section 4, we have, wherever possible, made use of both official statistics and proxy measures within the updated index so that we are not entirely reliant on data that is published with a significant lag. Future updates to this index will consider this issue further.

Data visualisation

We created an interactive tool to allow others to use the data we collected in a single location. No personal data is included in the underlying data sources, or the visualisations presented in the tool. All data included in the tool is openly available (via Open Government Licence for example). Where this is not the case, explicit permission for inclusion has been provided by the relevant party. The tool is available [here](#).

This tool includes an interactive map which allows users to select which metrics they wish to explore (eg overall index risk score). Users can also focus on an individual local authority or region to explore local patterns in an area of interest.

Users can also examine the component indicators of the index via the tool, alongside other contextual information such as deprivation, and how these compare to national averages. Finally, where appropriate, the underlying supporting open dataset is also made available in a machine-readable format with accompanying metadata which is in keeping with ODI best practice.

To help identify and manage ethical issues related to the collection, use and sharing of this data, we used the ODI's Data Ethics Canvas. The Data Ethics Canvas is a tool for anyone who collects, shares or uses data. It helps us identify and manage ethical issues around the use of data. In this project, it allowed us to think about data limitations and their consequences, as well as ensuring we considered the primary purpose for our use of data in this project. Within the canvas we have also explicitly considered potential positive and negative impacts

⁴⁸ End Fuel Poverty Coalition and Age UK (2021), 'English Fuel Poverty Index', <https://www.endfuelpoverty.org.uk/english-fuel-poverty-index-2021/>

from our work on different groups. The supporting Data Ethics Canvas for this work is available [here](#).

Desk research

To ensure that we built on existing work rather than duplicating research, we firstly undertook a desk-based review of fuel poverty in England. This involved online keyword searches of specific terms. We focused primarily on evidence which relates to the UK from the last five years. In a limited number of cases, we also included older evidence. Relevant evidence which we identified included:

- government policy documents and reports, and analyses from public sector bodies
- research reports published by consultancies, charitable groups and think tanks
- output from government departments and non-departmental public bodies.

We used this evidence in a variety of ways. In several cases, these sources guided us towards specific data assets which we included in our analysis. In addition, some sources highlighted questions, challenges or opportunities relating to data infrastructure in this context. Finally, where possible, we used the existing evidence to inform our terminology and definitions. All relevant sources are cited in subsequent sections of this report.

Stakeholder engagement

Our approach and conclusions have also been shaped by engagement with a variety of external stakeholders. These individuals and organisations have expertise either in fuel poverty or data infrastructure in this specific context. Their insights are reflected throughout this report. A full list is provided in the Annex.

We have worked in partnership with both Age UK and the End Fuel Poverty Coalition:

Age UK

- Age UK is the country's leading charity dedicated to helping everyone make the most of later life. It provides companionship, advice and support for older people who need it most.
- In the UK, Age UK helps millions of people every year, providing support, companionship and advice.

End Fuel Poverty Coalition

- The End Fuel Poverty Coalition is a broad coalition of anti-poverty, environmental, health and housing campaigners, charities, local authorities, trade unions and consumer organisations.
- The End Fuel Poverty Coalition campaigns to influence government and other bodies to take action to end fuel poverty and thereby improve people's health and quality of life, as well as seeking to reduce the cost of living, create jobs and negate carbon emissions in the process.

3. Current patterns of fuel poverty

In this section we summarise what is known about fuel poverty across England and relevant trends in key metrics. This helps to paint a detailed, data-informed picture of fuel poverty and at-risk groups which could support the design of services. Finally, the data gaps identified help to enable subsequent analysis presented in the next section.

In this section we present the results of our analysis of fuel poverty's current prevalence across the UK, as well as its impacts. Our work has combined multiple sources of data. These sources include nationally representative household surveys on the prevalence of fuel poverty and the potential size of the fuel poverty gap; administrative data on who receives specific types of government support; data from consumer groups on the volume of fuel costs information requests made; and data on the drivers of fuel poverty such as the energy efficiency ratings of homes. Our work provides valuable insights for three reasons:

- We bring together in a single piece of analysis multiple datasets, each relating to some aspect of fuel poverty. This unique combination of datasets has not been included in any previous work.
- We highlight how fuel poverty can impact groups who do not receive as much attention in this context but may be at risk nonetheless (eg those in work).
- We consider not only how best to derive insights from the data that is currently publicly available, but we have also noted data gaps and deficiencies. These shortcomings have informed how we approached the construction of our fuel poverty risk index (see Section 4), which is an attempt to fill some of the identified gaps.

Prevalence of fuel poverty amongst demographic groups in the UK

The Department for Business, Energy & Industrial Strategy (BEIS) publishes English fuel poverty statistics on an annual basis. The most recent wave was published in February 2022 and is based on 2020 data.⁴⁹ All figures are based on the English Housing Survey (EHS). This is a continuous national survey commissioned by the Department for Levelling up, Housing & Communities (DLUHC). Currently, each year around 13,300 interviews are conducted with

⁴⁹ BEIS (2022), 'Fuel Poverty Statistics', <https://www.gov.uk/government/collections/fuel-poverty-statistics>. The EHS data collected April 2019 to March 2020 (19-20 single year dataset) is combined with the data collected April 2020 to March 2021 (20-21 single year dataset) in order to produce the fuel poverty dataset used to estimate 2020 fuel poverty figures.

householders, and around 6,200 homes have a follow-up physical survey of their dwelling.⁵⁰

This dataset allows us to explore which types of households are most likely to be classified as fuel poor based on the government's definition, which covers England only.⁵¹ Below we have presented the proportion of households who are classified as being in fuel poverty, broken down according to various dimensions and characteristics.

On average, 13% of English households were classed as fuel poor in 2020 (this corresponds to over three million households). However, this average masks considerable variation. There are clear differences in the rate of fuel poverty between different groups of households. 25% of households who are privately renting their property are estimated to be in fuel poverty and 27% of households containing more than five residents are estimated to be in fuel poverty. These proportions are approximately double the national average.

Households containing children and young adults also experience higher rates of fuel poverty than households which are composed of older adults. Rates of fuel poverty for rural households and urban households are on average approximately equal (both 13.5%).

Unsurprisingly, households in the lowest income deciles experience higher rates of fuel poverty than households with higher incomes. Over 45% of households in the bottom two income deciles are classed as being in fuel poverty. Income distributions will be strongly correlated with a range of other factors including geography. Households at the bottom of the income distribution are over-represented in the North East, Yorkshire and the Humber and the West Midlands, for example.

Based on 2020 data, on average, the poorest 10% of households spend 7.7% of their income on fuel. The equivalent figure for the richest 10% of households is only 2.7%. These figures are expected to rise considerably this year due to higher energy prices.

⁵⁰ BEIS (2022), 'Fuel Poverty Statistics',

<https://www.gov.uk/government/collections/fuel-poverty-statistics>

⁵¹ In England, the government introduced a new definition of fuel poverty in 2021. This is known as the 'Low Income Low Energy Efficiency' (LILEE) definition. Under this definition, a household is fuel poor if they are living in a property with an energy efficiency rating of D, E or F, **and** their disposable income (after housing costs and energy needs) is below the poverty line. This implies that any household in a property with an energy efficiency rating of C or better (48% of dwellings in 2020/19) cannot be defined as being in fuel poverty (regardless of their income or the level of energy prices).

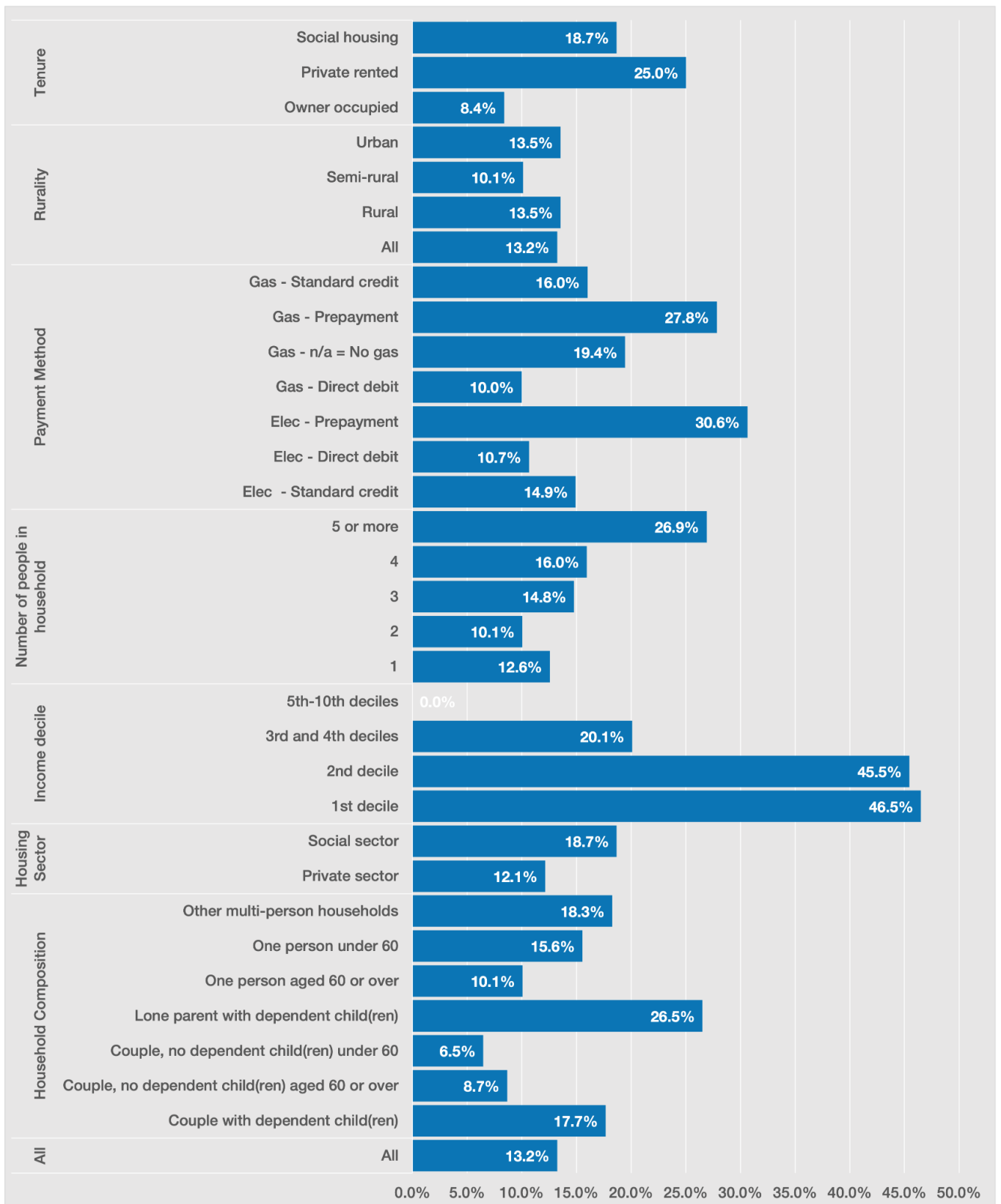


Figure 4: Breakdown of fuel poverty rates (2020) by household type and sociodemographic characteristics. BEIS, 2022

Finally, we can use the BEIS data to break down the prevalence of fuel poverty according to households' energy payment method. Households using a prepayment electricity meter are more likely to be fuel poor (31%) when compared with households paying by direct debit (11%). This will be because, on average, households who pay using prepayment meters pay a higher unit price for energy and also have lower incomes.

Examining the proportion of different household groups classed as fuel poor using the government's definition does help to highlight at-risk groups. However, these figures by themselves do not provide any insight into the magnitude of the challenge faced by households who are classed as fuel poor. Some of these households may be marginally below the poverty line (after fuel costs have been considered), while others may need more considerable support. We have therefore also examined data on the reduction in fuel costs needed for fuel poor households to be no longer classed as fuel poor. This is known as the fuel poverty gap.⁵²

When we break down the average fuel poverty gap by household group (below), some interesting differences emerge relative to the prevalence split (presented above). We see that rural households that are classed as fuel poor have a far larger fuel poverty gap (£501 needed annually on average to lift each of those households out of fuel poverty) than fuel poor households in urban areas (£193). This implies that even though average rates of fuel poverty are approximately equal across rural and urban areas, those that are fuel poor in rural areas require a particularly large reduction in fuel costs (relative to fuel poor urban households).

This highlights the complexity of trying to target resources towards specific groups and emphasises the need for granular data which allows for these nuances to be explored and accounted for. It may be, for example, that support in one locality needs to be spread across a relatively high proportion of the population (all of whom have a similar level of need), whereas another local area may be better served targeting a higher level of support towards a smaller group of households.

⁵² BEIS (2022), 'Fuel Poverty Statistics',
<https://www.gov.uk/government/collections/fuel-poverty-statistics>

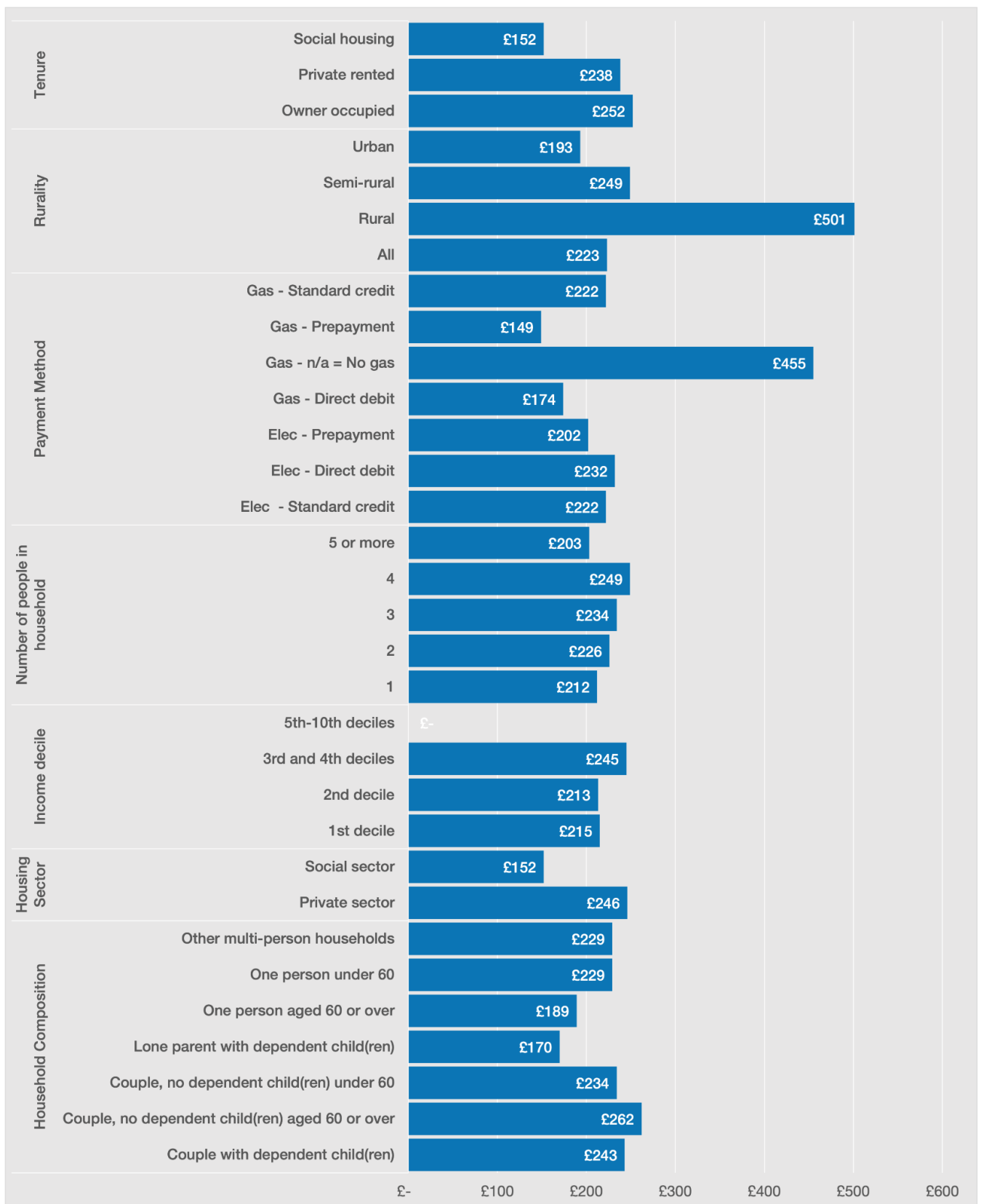


Figure 5: Breakdown of fuel poverty gap (2020) by household type and sociodemographic characteristics. BEIS, 2022

We can also explore regional differences in the proportion of households that are classed as living in fuel poverty. The West Midlands and Yorkshire and the Humber contain the highest proportion of households in fuel poverty (17.8% and 17.5% respectively). London and the south of England have markedly lower rates (all below 12%).

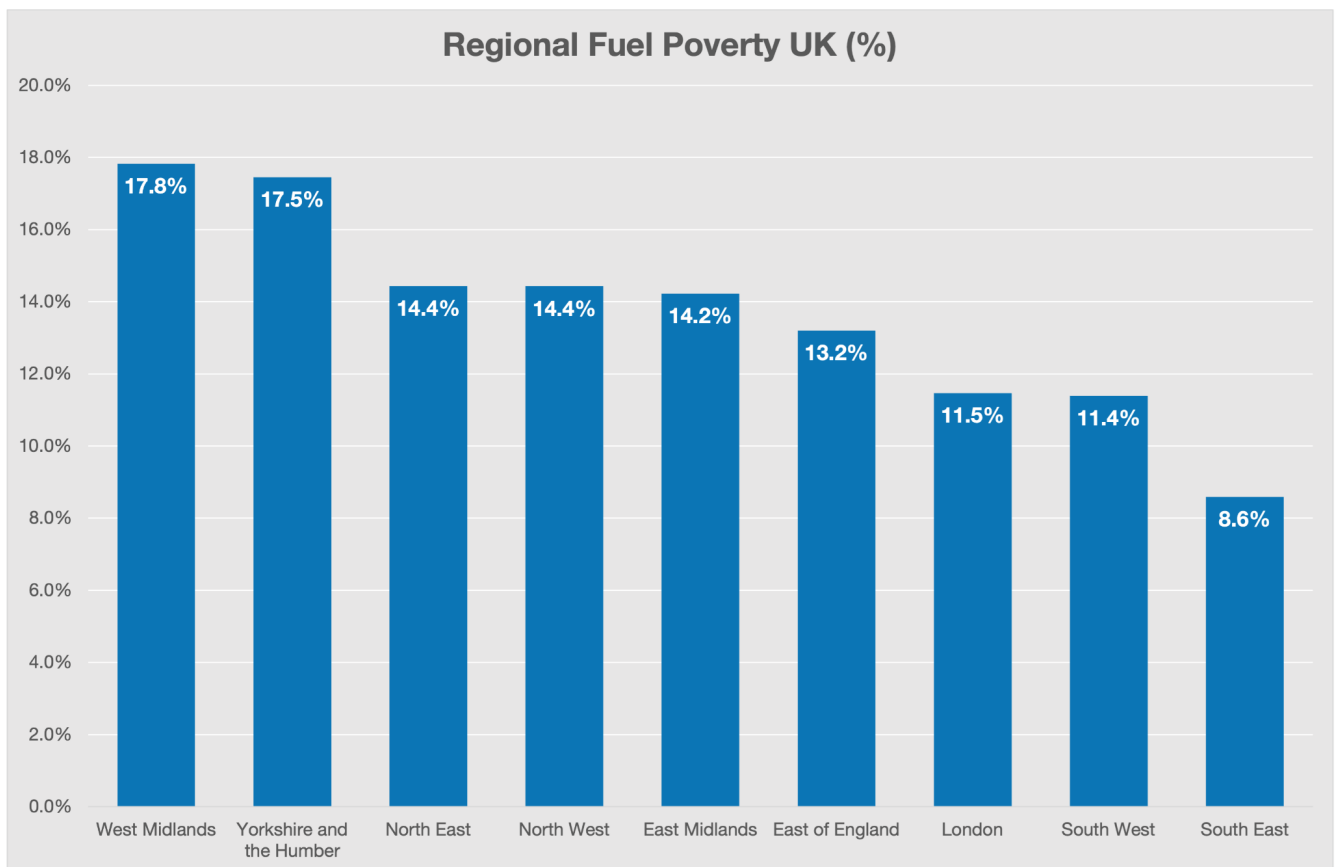


Figure 6: Breakdown of fuel poverty rates (2020) by region. BEIS, 2022

This will largely be driven by differences in the energy efficiency of housing stock by region (as well as differences in income and variation in the average level of energy consumption by region). London has the highest proportion of energy efficient homes of any English region. Almost half of London dwellings (49%) have an EPC rating of C or above. The West Midlands and Yorkshire and the Humber have the lowest rate of energy efficient homes (approximately 38% of homes in both regions have an EPC rating of C or above).

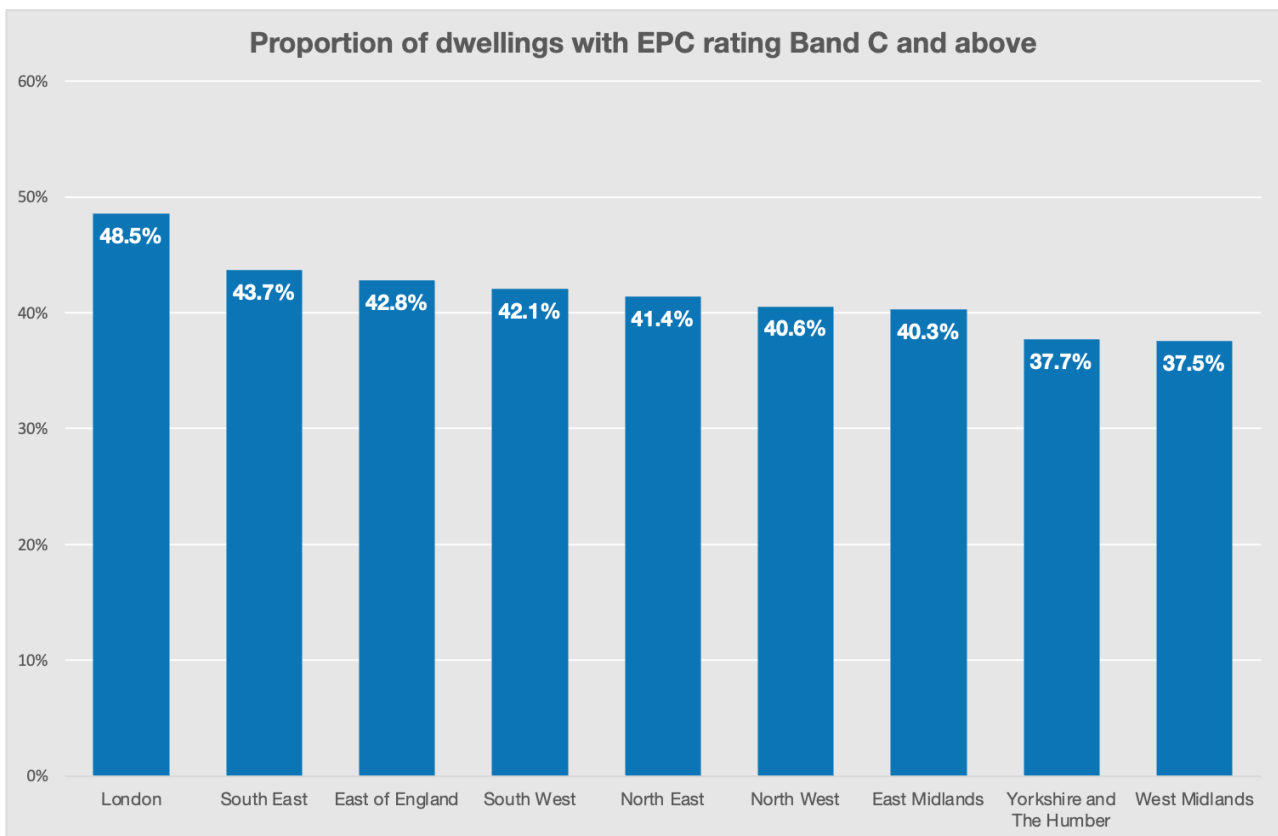


Figure 7: Breakdown of energy efficiency ratings (2020) by region. DLUHC, 2022

However, even within these large regions there will be significant variation. For example, we have also examined which areas contain the highest number of homes without a reasonable degree of thermal comfort (one of the components of the Decent Homes Standard which applies to all social housing).⁵³ Despite the fact that London had the best overall energy efficiency rating on average, two of the five local authorities with the highest number of social housing dwellings without a reasonable degree of thermal comfort were in London (Lewisham and Greenwich). This highlights the importance of drilling down into local areas wherever possible.

When we break down the average fuel poverty gap by region (below), we see a different pattern to the prevalence split (presented above). We see that amongst households that are classed as fuel poor, the South West has the largest average fuel poverty gap (despite having below average rates of fuel poverty overall). This may be linked to the higher average fuel poverty gap amongst rural households, as noted above.

Therefore, even though a relatively small proportion of households in the South West are in fuel poverty (compared to other regions of England), those that are at risk require a particularly large reduction in fuel costs. On average, each fuel poor household in the South West required a £287 annual reduction in energy bills to no longer be classed as fuel poor. The opposite is true in the North East, which contains an above average fuel poverty rate but a below average fuel poverty gap size (£155).

⁵³ Department for Communities and Local Government (2006), 'A Decent Home: Definition and guidance for Implementation', https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7812/138355.pdf

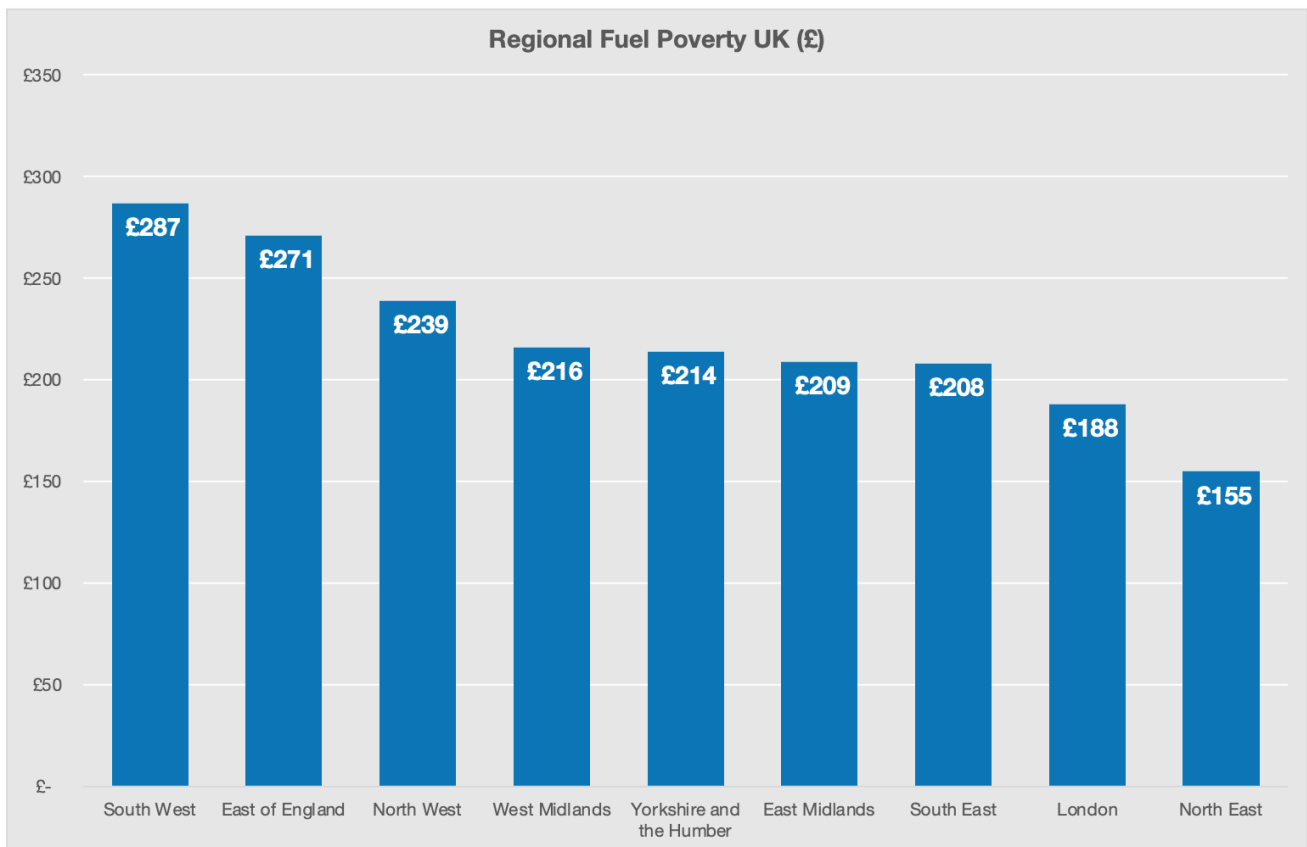


Figure 8: Average fuel poverty gap (2020) by region. BEIS, 2022

Trends in fuel poverty

BEIS also publishes information on how many households are classified as fuel poor over time (based on the definition provided above). Between 2010 and 2020, we can see a slow and steady decline in the proportion of households who are living in a property with an energy efficiency rating of D, E or F, and have a disposable income (after housing costs and energy needs) which is below the poverty line. In 2010, 22% of households fell into this category, while the equivalent figure in 2020 was 13.2% (the average fuel poverty gap also fell over the same period from £390 to £223).

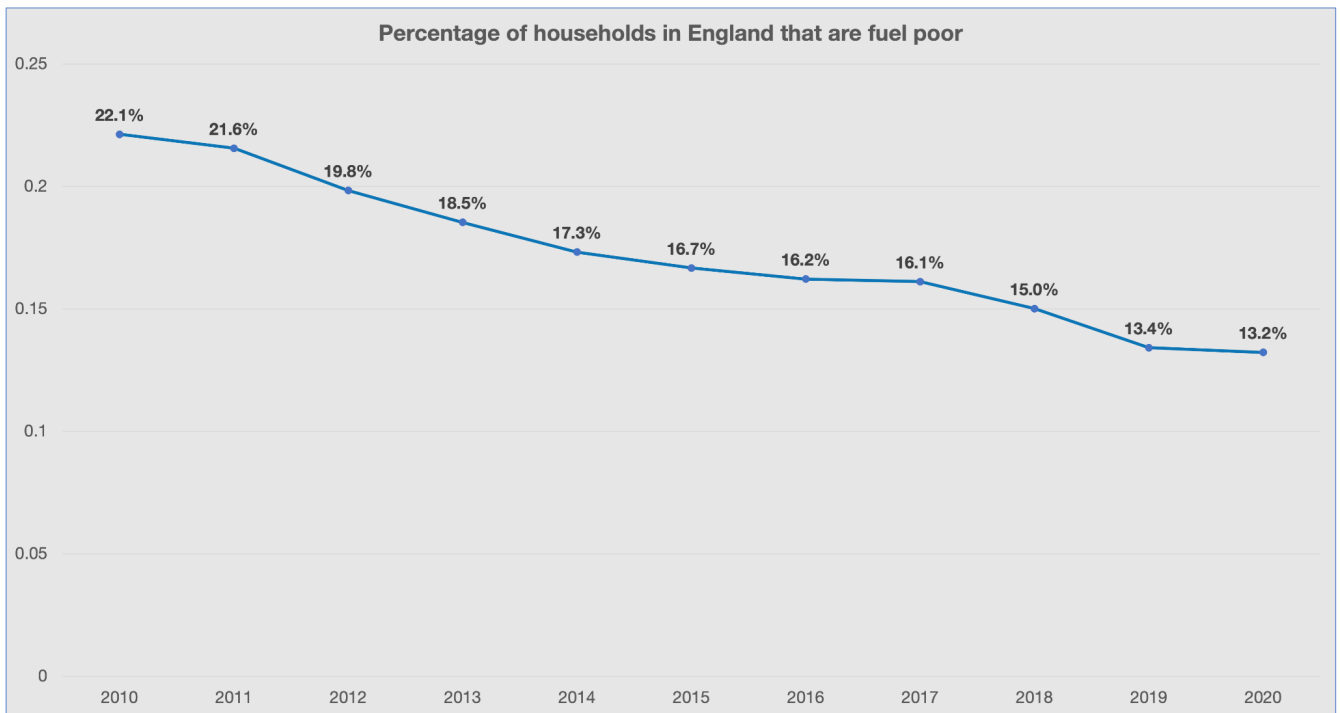


Figure 9: English fuel poverty rates (2010–2020). BEIS, 2022

These falls are partially driven by gradual improvements made to some parts of England’s housing stock, as well as largely flat energy prices over the period 2010 to 2020. This trend will not incorporate recent rises in energy prices as 2020 is the most recent year included in the dataset (published in 2022).

Also, fuel poverty rates suggested by this indicator will also understate the current scale of the issue, as households living in homes with an energy efficiency rating of C or above can never be counted as fuel poor, even if they are likely to endure significant financial hardship to heat their homes. To help quantify the potential scale of need within this group, we have examined the correlation (at local authority level) between the proportion of energy efficient dwellings and household income. Overall, 26% of local authorities have a high proportion of energy efficiency dwellings but a low median income. Households in these areas are less likely than average to be classed as fuel poor by the government, but may still be struggling to pay for fuel.

We can also look at how the composition of the fuel poor group has changed over time. We have broken fuel poor households down into three groups based on their economic status below. We can observe a consistent rise in the portion of fuel poor households that contain someone in work. This group accounted for 38% of all fuel poor households in 2010 and 48% of all fuel poor households in 2020.

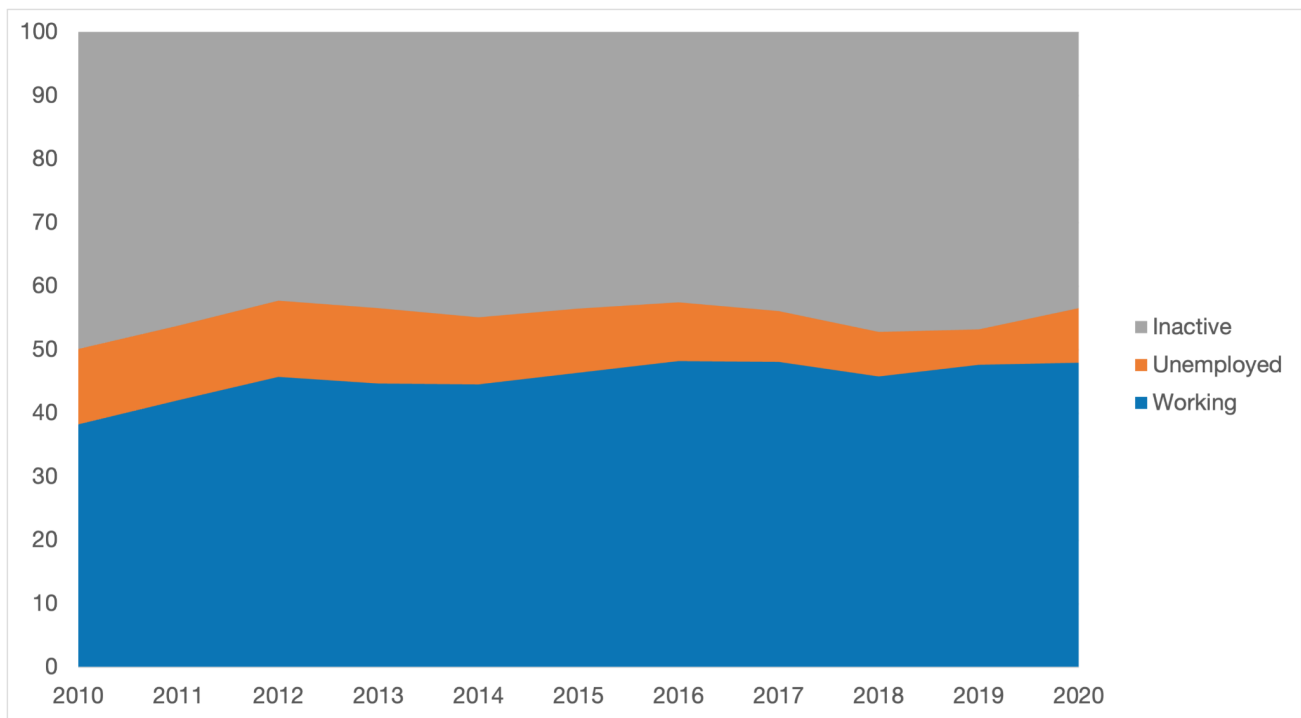


Figure 10: Breakdown of fuel poverty population by economic activity (2010–2020). BEIS, 2022

National support provided

One of the mechanisms that was used by the government to help combat fuel poverty was the provision of Green Homes Grant vouchers (GHGV). These vouchers were used to make energy efficient improvements to homes (the scheme closed for new voucher applications in March 2021).⁵⁴ Funds were made available to improve insulation and/or install low carbon heating measures (eg a heat pump or solar thermal panels).⁵⁵ The GHGV scheme was split between the main and low-income streams. Households that were in receipt of certain benefits⁵⁶ were allocated to the low-income scheme and could receive more generous support.

In total, there were over 113,000 applications for the scheme.⁵⁷ However, only £314 million of the original £1.5 billion budget was spent; and 47,500 homes were upgraded, rather than the 600,000 which was originally envisaged.⁵⁸ BEIS publishes data on the proportion of supported households that were on the low-income GHGV scheme versus the main GHGV scheme.⁵⁹ We have broken these statistics down on a regional basis. Across England, 60% of households supported by the GHGV scheme were classed as low income (based on benefit

⁵⁴ BEIS (2020), 'Green Homes Grant',

<https://www.gov.uk/guidance/apply-for-the-green-homes-grant-scheme>

⁵⁵ Other secondary measures can be included alongside these primary measures (eg draught proofing or heating controls).

⁵⁶ Attendance Allowance, Carer's Allowance, Disability Living Allowance, Pension Credit, Employment and Support Allowance, Jobseeker's Allowance, Housing Benefit, Income Support, Industrial Injuries Disablement Benefit, Personal Independence Payment, Severe Disablement Allowance, Tax Credits, Universal Credit

⁵⁷ Hansard (2021), 'Green Homes Grant Voucher Scheme',

<https://hansard.parliament.uk/commons/2021-05-27/debates/64745008-6EAD-451D-B66E-237BF717591D/GreenHomesGrantVoucherScheme>

⁵⁸ House of Commons Committee of Public Accounts (2021), 'Green Homes Grant Voucher Scheme', <https://committees.parliament.uk/publications/8007/documents/82623/default/#:~:text=In%20July%202020%2C%20as%20part.%C2%A31.5%20billion%20made%20available.>

⁵⁹ BEIS (2022), 'Green Homes Grant Voucher data',

<https://www.gov.uk/government/statistics/green-homes-grant-voucher-release-february-2022>

receipt). While the remaining 40% of households were supported by the main GHGV and were not in receipt of means-tested benefits.

In the North West, 78% of households that had at least one measure installed via the GHGV scheme are classed as low income (when they applied for a grant between September 2020 and March 2021), which is markedly higher than the national average. The equivalent figure in the South East is only 33.6%.

This could reflect a higher demand for this type of home improvement amongst low-income households in certain parts of the country, as well as geographic differences in the rates of benefit receipt. Understanding the drivers behind this variation could aid the design of future support schemes.

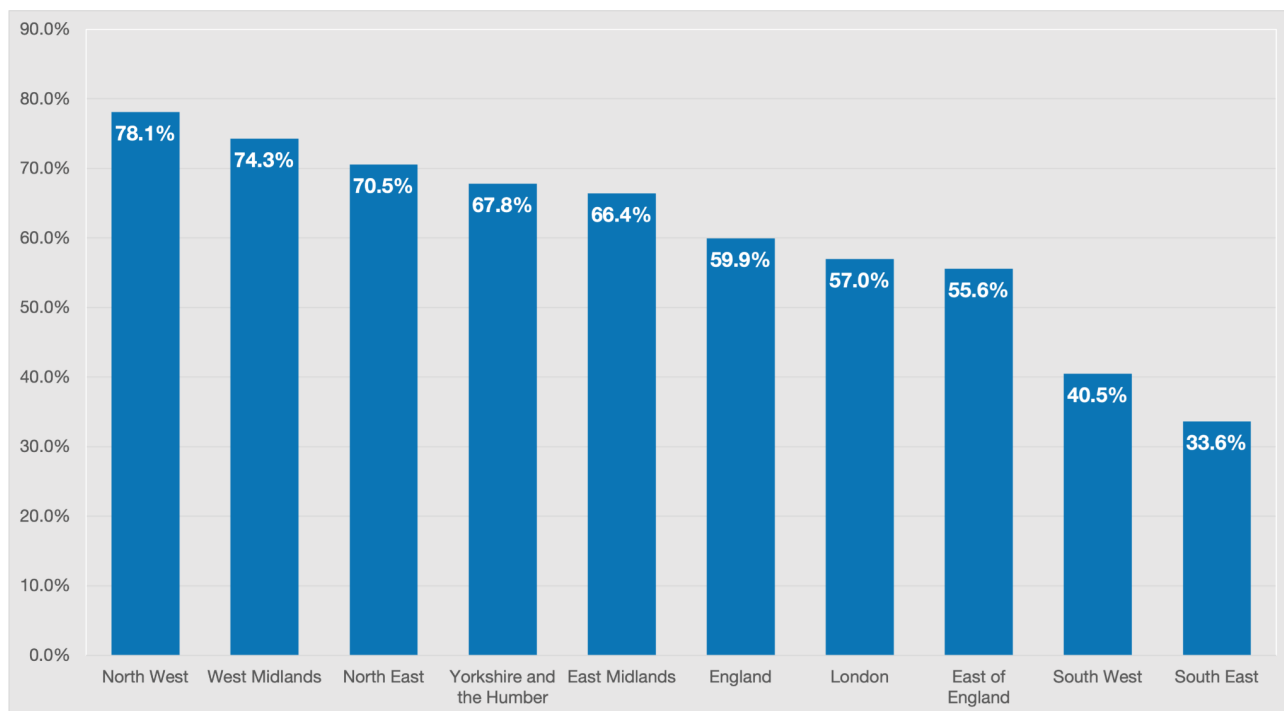


Figure 11: GHGV low income and main scheme recipients, by region. BEIS, 2022

Other forms of support are not based on ability to pay for energy. For example, Winter Fuel Payments are awarded automatically to anyone who receives a state pension, regardless of their financial position. That means that areas containing a high proportion of people of state pension age (such as North Norfolk, Rother and East Devon) will contain a high rate of benefit receipt in this case, regardless of their income level. However, areas with younger populations (e.g. Tower Hamlets, Newham and Hackney), will on average receive less per head of population.

Impacts of fuel poverty

The National Energy Action Group has noted that prolonged periods when households struggle to pay their energy bills can lead to increasing and unsustainable levels of debt for households, as well as unsafe, self-regulated energy rationing (where people make a choice to cut back on energy use) and even voluntary self-disconnection by those with prepayment meters.⁶⁰

Fuel poverty can have a direct impact on health and wellbeing. Previous research

⁶⁰ [National Energy Action. 'About NEA'. https://www.nea.org.uk/who-we-are/about-nea/](https://www.nea.org.uk/who-we-are/about-nea/)

suggests that some 10% of excess winter deaths are directly attributable to fuel poverty.⁶¹ In total, there were 29,290 excess winter deaths in England and Wales (excluding COVID-19) in 2019 to 2020 across England and Wales.

Cold homes can affect or exacerbate a range of health problems, including respiratory problems (including COVID-19), circulatory problems and increased risk of poor mental health. Cold homes can also affect wider determinants of health, such as educational performance among children and young people, as well as work absences.⁶²

Data infrastructure issues

Narrow fuel poverty definition

As we have described in detail above, the government chose to formally adopt the ‘Low Income Low Energy Efficiency’ fuel poverty definition in 2021, as part of a wider update to England’s Fuel Poverty Strategy.⁶³ This followed a public consultation in which most respondents were in favour of using this metric. Reasons given in support of the proposed change include the simplicity of the metric and the increased focus on energy efficiency.⁶⁴

However, this definition is also narrow. It eliminates the possibility of any household being classed as fuel poor if they are living in a property with an energy efficiency rating of C or better (almost half of all English households currently). The rapidly rising energy prices seen in recent months will significantly impact large proportions of the population (even after government support mechanisms take effect). Many of the affected households will be living in energy efficient homes and therefore will not be captured in any official rise in fuel poverty.

It may therefore be necessary to consider a wider suite of potential metrics to ensure the full scale of the issue is being recognised and tracked over time. These metrics could consider both the volume of resources that different households are required to devote to energy bills, as well as their ability to meet these costs given their overall financial situation.

Recency of data

The national statistics on English fuel poverty (under the government’s updated definition), which are published by BEIS, are not sufficiently up to date to inform

⁶¹ The Health Foundation (2022), ‘Failure to act on cost of living risks another health crisis’, <https://www.health.org.uk/news-and-comment/news/failure-to-act-on-cost-of-living-risks-another-health-crisis>

Public Health England (2014), ‘Fuel poverty and cold home related health problems’, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/355790/Briefing7_Fuel_poverty_health_inequalities.pdf

⁶² Ibid.

⁶³ HM Government (2021), ‘Government Response to Consultation on Updating the Fuel Poverty Strategy for England’, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/960083/fuel-poverty-strategy-for-england-government-response.pdf

⁶⁴ Ibid.

the design of policy initiatives to tackle the current crisis. Data which relates to 2021 will not be made available until February 2023.

Therefore, either BEIS needs to prioritise publication of this data with a shorter lag and/or more recent proxy information may be needed to help fill this gap and allow for responsive policy initiatives.

Data granularity

Fuel poverty statistics published by BEIS do allow us to see which types of households are more likely to be classified as fuel poor (as we have shown in detail above). These statistics and the analyses they underpin are valuable. However, any analysis of this data is limited in terms of its detail. The sample size of the underlying English Housing Survey consists of 13,300 interviewees each year. This means that the publicly available breakdowns cannot include interactions between multiple characteristics (eg what the current rates of fuel poverty amongst households that are in the bottom income decile are, and which are rented and have five or more residents).

In order to better understand fuel poverty and for policymakers to make informed decisions, there is a need for data at greater levels of granularity and coverage. This can then facilitate detailed local-level decisions made by policymakers, public service delivery agencies and charities.

Targeting of government support

England's 2015 Fuel Poverty Strategy⁶⁵ recognised that fuel poverty support needs to be “appropriately targeted” and included an explicit ambition to use “government data to improve targeting rates”. It is vital to understand the extent to which current support mechanisms are effectively targeted and the progress achieved by the government in meeting its stated aim.

As we have shown, there is information available on the proportion of GHGV recipients who are classed as ‘low income’. However, this scheme (which is now closed for new applications) and other support schemes, rely entirely on benefit receipt being a good proxy for underlying fuel poverty needs. Previous work has highlighted that “government rely [sic] too heavily on receipt of benefits as a proxy to identify fuel poor households”.⁶⁶ Other support schemes (such as the recent Energy Bill Discount Scheme or Winter Fuel Payments) are not means tested at all.

Analysis by Deloitte⁶⁷ highlighted that current policies aimed at assisting the fuel poor are constrained in their ability to effectively target fuel poor households. This work also noted that a key challenge to delivering these schemes has been the identification of households for support, many of whom may be unaware that they

⁶⁵ HM Government (2015), ‘Cutting the cost of keeping warm a fuel poverty strategy for England’, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/408644/cutting_the_cost_of_keeping_warm.pdf

⁶⁶ Committee on Fuel Poverty (2021), ‘Annual Report’, <https://www.gov.uk/government/publications/committee-on-fuel-poverty-annual-report-2021>

⁶⁷ Deloitte LLP (2020), ‘Better use of data and advanced statistics / machine learning in delivering benefits to the fuel poor’, <https://www.gov.uk/government/publications/better-use-of-data-and-ai-in-delivering-benefits-to-the-fuel-poor-research-report-and-cfps-recommendations>

meet the eligibility criteria. Deloitte concluded that there are large potential benefits from the implementation of advanced analytical techniques to aid with identification of households in most need of support.⁶⁸

It would be valuable to compare data on recipients of fuel poverty support schemes to a holistic set of metrics which represent fuel poverty needs and ability to pay for energy. This would allow us to better understand the extent to which current support is targeted at those most in need. This is not available currently at a local level using up-to-date data and a sufficiently broad suite of indicators.

⁶⁸ However, they also note that significant implementational issues such as protection of individuals' privacy would need careful consideration.

4. Fuel poverty risk index

In this section we describe the composition of our updated fuel poverty risk index. Its design and features have been informed by the data gaps and underlying data infrastructure challenges described earlier in this report. We also present initial insights derived from the data. This work highlights the importance of considering a broad suite of metrics when trying to understand fuel poverty and quantifies the extent to which current government support is targeted towards the areas with the most acute fuel poverty needs.

In this section we introduce our updated fuel poverty risk index and the results of our new analysis. This analysis is based on the data that has been aggregated as part of the risk index. Our work provides valuable insights for two reasons:

1. We have attempted to partially fill some of the data shortcomings and gaps that we identified in Section 3. The range of metrics that we have used to explore both the demand for energy and ability to pay in each of England's local authorities will enable a more nuanced understanding of fuel poverty.
2. The comparisons that we have made between underlying need and the level of government support provided in each area highlights the extent to which targeting of public resources could be improved. The accompanying local area tool highlights specific areas in need of additional support.

Index composition

As noted in Section 3, the current definition of fuel poverty in England is narrow and could potentially exclude many households who are struggling to heat their homes. We therefore want to ensure that our index highlights as many interrelated factors as possible that might drive rates of fuel poverty.

Domains

The fuel poverty risk index is divided into two primary domains:

- local area **demand for fuel** (based on metrics such as housing quality and climate patterns)
- local area **ability to pay for fuel** (based on income and deprivation metrics).

The subdomains range from 0 to 100 (where 100 represents the highest risk for fuel poverty and 0 represents the lowest risk). These subdomain scores are themselves a weighted average of multiple domain level indicators (see below).

As noted above, the collection and publication of fuel poverty statistics is not uniform across the four nations of the UK. Our data analysis has therefore focused on England only. Future work could consider how to extend this index to cover all of the UK. We have combined the results from these two separate domains to create an overall index risk score for each local authority in England that takes into account the combined burden of high demand for fuel and a low ability to pay. This provides a robust and comprehensive indication of the extent of fuel poverty in each area.

As noted in Section 3, it would be helpful if we could better understand the extent to which current support is targeted towards those most in need. We have therefore also produced a local authority score which represents the level of support that the government is providing in that specific local area. Comparing this support score to the overall fuel poverty risk index that we have described above could be a valuable starting point when trying to identify areas which may be in need of further support in what looks (at time of writing) to be a worsening situation.

Metrics

Each domain consists of a range of indicators which are outlined in the table below. These metrics have been standardised, weighted and combined to form the overall subdomain scores for each local authority in England.

The index that we have created builds on previous work carried out by the End Fuel Poverty Coalition⁶⁹ and Age UK.⁷⁰ In 2021, in response to the increasing challenges around affordability of fuel, the End Fuel Poverty Coalition partnered with Age UK to produce the English Fuel Poverty Index⁷¹ for the first time. In our updated index, we have included 12 metrics. This is more comprehensive than last year's iteration of the index which was based on a subset of three metrics.

Several of these metrics relate to 2022 or 2021, which helps to partially overcome the data lags which we identified in Section 3.

| Indicator and most recent wave | Type of data | Category |
|---|-------------------------------------|----------|
| Weather: 2022 | Average minimum monthly temperature | Demand |
| EPC Ratings: 2021 | Rate (% of dwellings) | Demand |
| Decent Homes Delivery: Dwellings without a reasonable degree of thermal comfort: 2021 | Number of dwellings | Demand |
| ONS Population (by Age): 2021 | Rate (% of population) | Demand |

⁶⁹End Fuel Poverty Coalition, <https://www.endfuelpoverty.org.uk/>

⁷⁰ Age UK, <https://www.ageuk.org.uk/>

⁷¹ End Fuel Poverty Coalition and Age UK (2021), 'English Fuel Poverty Index', <https://www.endfuelpoverty.org.uk/english-fuel-poverty-index-2021/>

| Indicator and most recent wave | Type of data | Category |
|--|--------------------------------|----------------|
| Households with 4 or more people: 2011 | Rate (% of households) | Demand |
| Disability benefits: 2022 | Rate (% of population) | Demand |
| Distance from supermarket: 2018 | Average | Demand |
| Distance from GP surgery: 2019 | Average | Demand |
| Household Income: 2021 | Average | Ability to pay |
| Income Deprivation Affecting Older People Index (IDAOPI): 2019 | Rate (% of elderly population) | Ability to pay |
| Income-related benefits: 2022 | Rate (% of population) | Ability to pay |
| Single parent households: 2011 | Rate (% of households) | Ability to pay |
| Winter Fuel Payment: 2019/20 | Rate (% of population) | Support |
| Green Homes Grants: 2022 | Rate (% of households) | Support |
| Eco Flex: 2021 | Rate (% of households) | Support |
| Household Support Grant Funding: 2022 | Rate (% of households) | Support |

Table 2: Fuel poverty risk index metrics

Geographical coverage

As noted in Section 3, it is important to provide as much granularity as possible when exploring the nuances of fuel poverty. With that in mind, the index gives insights at the lower tier local authority level. Also, in keeping with the 2021 index, due to the availability of data, the index remains focused on English local authorities.

Geographical variation in fuel demand and ability to pay

Fuel demand

The heatmap that we present below shows variation in the demand for energy/fuel across England at the local authority level. This demand domain is composed of eight indicators.

We observe substantial variation. In general, households in local authorities that are based in the North West tend to have higher demand for fuel/energy than households based in other parts of the country. This will partially be due to below average energy efficiency ratings of homes in that region, combined with relatively cold weather compared to other parts of England.

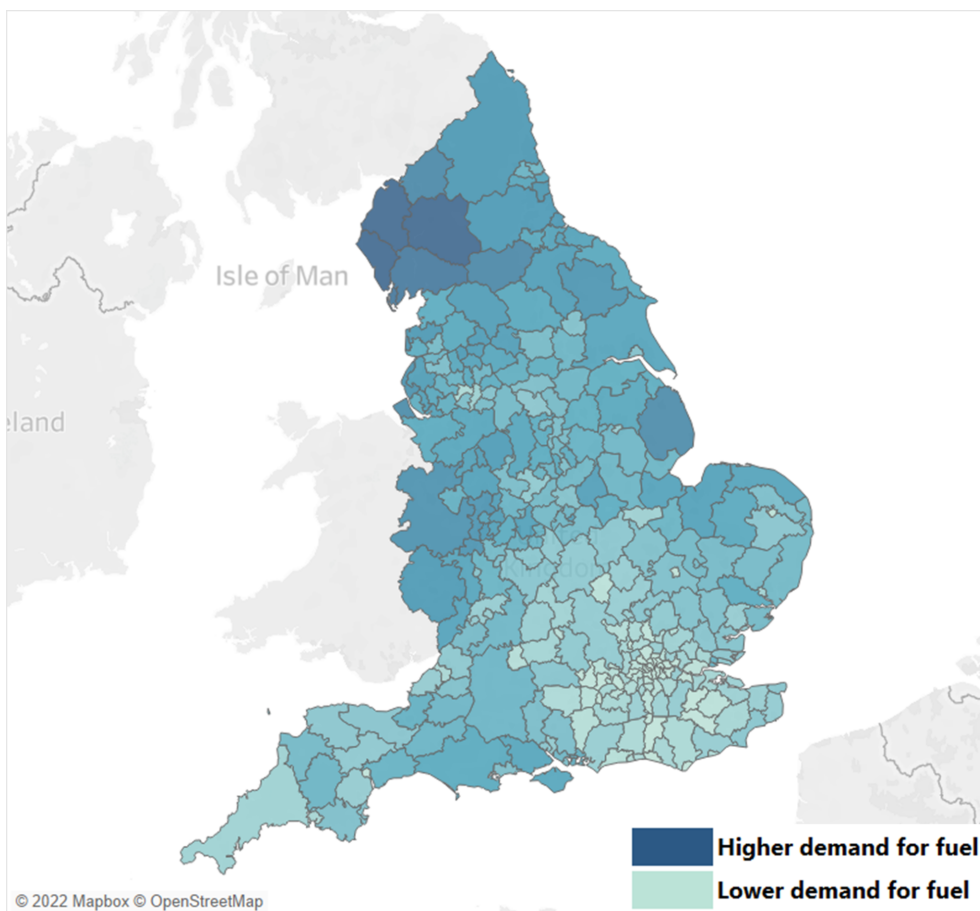


Figure 12: Geographical variation in demand for fuel

We have listed the top and bottom five areas in terms of local authority fuel demand in the table below. As the overall demand score is a weighted average across several indicators, some local authorities will have higher demand scores for different reasons. For example, Copeland (in Cumbria in North West England) has a high demand subdomain score because households there tend to live in homes that are less energy efficient than average and the average local area monthly temperatures are markedly lower than the national average. South Lakeland in the North West of England (which is also in the top five) has high fuel demand because its population is older than average (a relatively high proportion of households is aged over 65).

All areas in the bottom five (indicating lower than average demand for fuel) are based in London. This is largely because of the higher than average energy efficiency ratings of the London housing stock relative to the rest of the country.

| Top 5 local authority areas: higher demand for fuel | Bottom 5 local authority areas: lower demand for fuel |
|---|---|
| Eden (North West) | Tower Hamlets (London) |
| Copeland (North West) | Southwark (London) |
| Allerdale (North West) | Hackney (London) |
| Barrow-in-Furness (North West) | Islington (London) |
| South Lakeland (North West) | Wandsworth (London) |

Table 3: Top and bottom local authorities: demand for fuel

Ability to pay

The index that we have created also considers the ability of households around England to pay for increased energy costs. This is calculated independently of households' relative demand for energy (which we presented above) and is composed of a further four indicators. The heatmap shown below shows variation in the ability to pay for energy across England at the local authority level. In general, there is considerably more geographic variation in ability to pay than demand for fuel. Overall, households in local authorities that are based in the North of England and the Midlands tend to struggle the most with paying for energy.

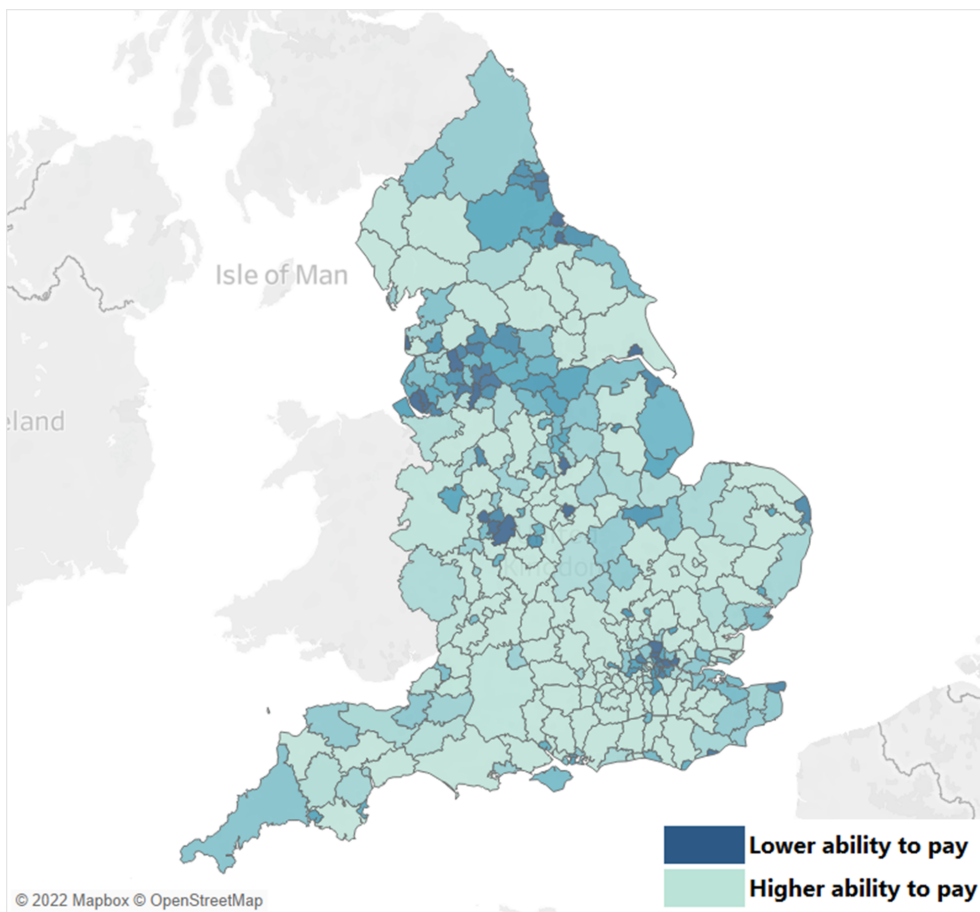


Figure 13: Geographical variation in ability to pay for energy costs

We have listed the top and bottom five areas in terms of ability to pay for energy costs at the local authority level in the table below. As the overall ability to pay score is a weighted average across several indicators, some local authorities will have higher scores for different reasons. For example, households in Blackpool, situated on the north west coast of England, are more likely than average to find energy unaffordable because that local authority contains a high proportion of households on Universal Credit (which is a proxy for low income within this subdomain). Manchester also features among the top areas where households struggle to afford fuel costs, primarily due to its high Income Deprivation Affecting Older People Index (IDAOP) score. The IDAOP is a measure of income deprivation amongst older people and is also included in our ability to pay subdomain.

Households that are least likely to experience financial stress from energy costs are more likely to live in the south east of the country. Four out of the bottom five local authorities are situated in the South East. Compared to the rest of the country, average incomes in these areas tend to be higher and rates of benefit receipt are relatively low.

| Top 5 local authority areas: more likely to struggle paying for energy costs | Bottom 5 local authority areas: less likely to struggle paying for energy costs |
|--|---|
| Barking and Dagenham (London) | Fareham (South East) |
| Manchester (North West) | Surrey Heath (South East) |
| Knowsley (North West) | St Albans (East of England) |
| Blackpool (North West) | Sevenoaks (South East) |
| Middlesbrough (North East) | Wokingham (South East) |

Table 4: Top and bottom local authorities: ability to pay for energy costs

Overall potential for fuel poverty

As we have noted throughout this report, adequate measurement of local area fuel poverty requires the use of a broad suite of measures which considers a range of interrelated factors. We have individually presented above the variation in local area **demand for fuel** and local area **ability to pay for fuel** (each of which are based on several individual sub-components). In this section, we combine these two domains to calculate an overall fuel poverty score for each local authority. This measure is holistic and makes use of the most recent wave of 12 publicly available datasets.

The heatmap shown below shows variation in overall fuel poverty potential across England at the local authority level.

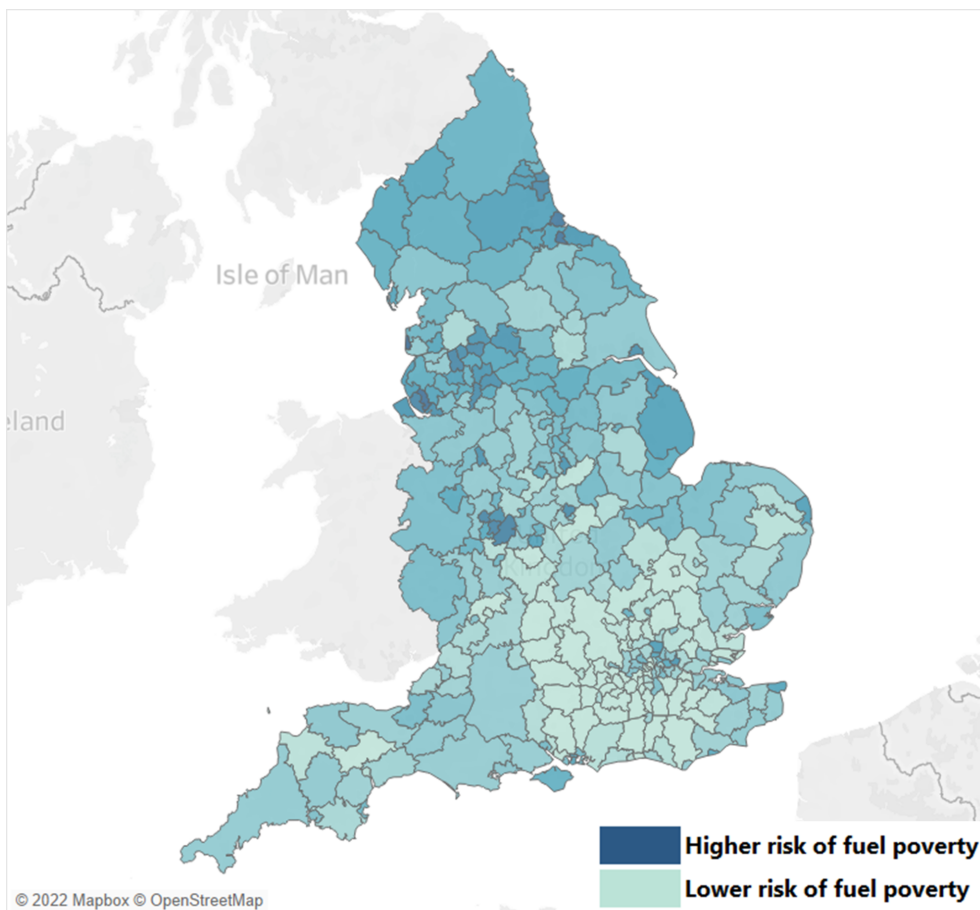


Figure 14: Geographical variation in potential for fuel poverty

Households living in Blackpool have the highest potential for fuel poverty based on our aggregate metric. This is because households in that area tend to have below average incomes (incomes in Blackpool are 27% below English average) and have an above average proportion of the population in receipt of Universal Credit (15% in Blackpool versus 8% nationally). In addition, 73% of dwellings in Blackpool are classed as energy inefficient (below a rating of C) which is above the national average (68%).

| Ranking regions most likely to struggle paying for energy costs | |
|---|--|
| Updated fuel poverty risk index (based on fuel poverty risk of constituent local authorities) | Existing government definition (% of households in fuel poverty) |
| North East | West Midlands |
| North West | Yorkshire and the Humber |
| Yorkshire and the Humber | North East |
| West Midlands | North West |
| East Midlands | East Midlands |

Table 5: Ranking of regions with highest risk of fuel poverty (updated fuel poverty risk index versus existing government definition of fuel poverty)

Overall, households living in the North East, North West and Yorkshire and the Humber have the highest potential for fuel poverty according to our updated fuel poverty risk index. This has some similarities with the regional breakdown of households in fuel poverty according to the government's definition. The government's narrower metric also identifies the same five regions as having the highest rate of fuel poverty. However, the ordering is different. For instance, the North East comes out as the highest risk region in our fuel poverty risk index, but is only ranked as the third highest region according to the government's definition. This could potentially mean that adopting a more holistic suite of indicators when measuring fuel poverty could lead to different decisions regarding the targeting of support.

This emphasises the value of our new analysis. Consideration of a wider suite of relevant factors can lead to different conclusions regarding areas with the highest need. The tool that we have developed allows users to dive deeper into each region to identify particular hotspots of need to target support most effectively.

Geographical variation in targeting of government support

In this subsection we firstly present the extent of geographic variation in the amount of support provided to households to combat fuel poverty. As we set out in Table 2 above, we have included the following support measures in our analysis: Winter Fuel Payments, Green Homes Grants, Eco Flex payments and Household Support Grant Funding. Understanding the extent to which local patterns of support correlate with need is vital. Our index allows us to compare data on support schemes to a holistic measure of fuel poverty to answer this question.

The heatmap shown below indicates a variation in the level of support provided by the government either to: (1) promote energy efficiency; or (2) mitigate the consequence of fuel poverty across England at local authority level. This score is weighted with consideration for the differences in population size across local authorities.

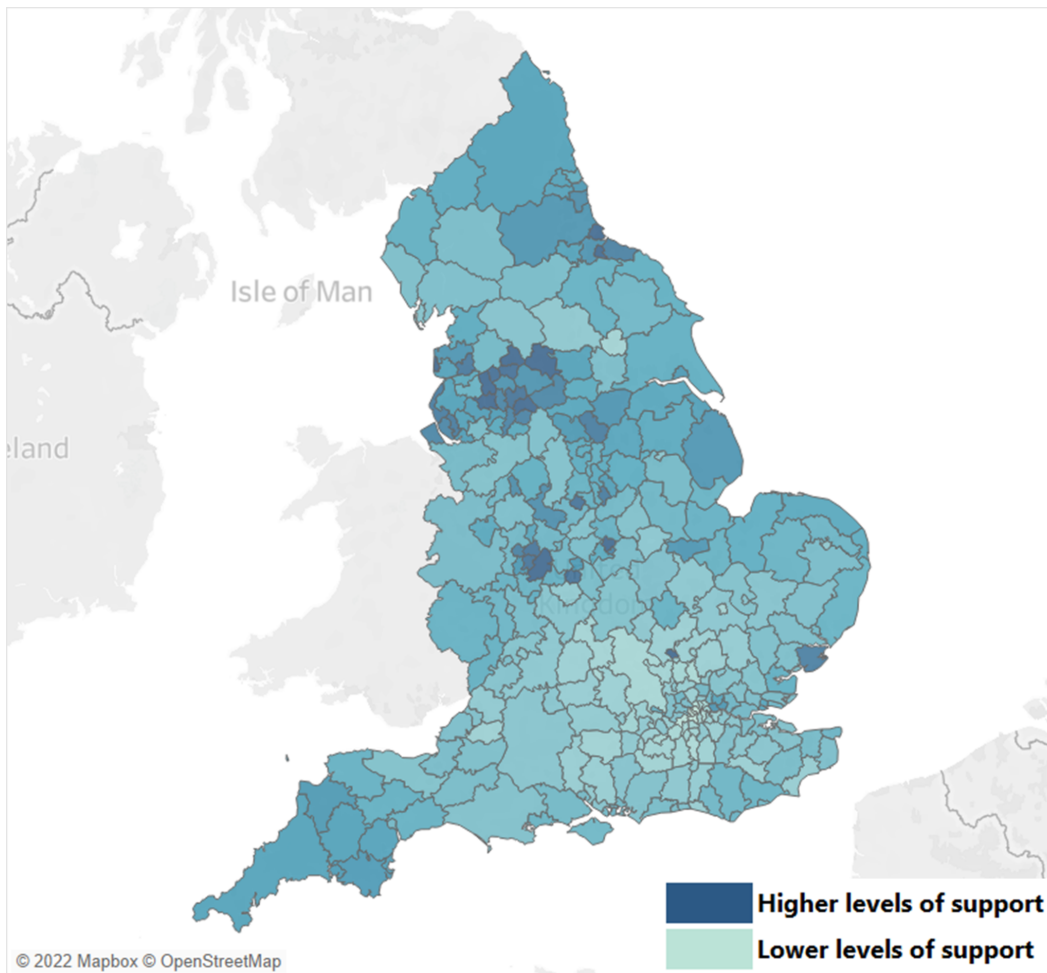


Figure 15: Geographical variation in support provided

We can see from this that some of the areas we identified as having the highest overall potential for fuel poverty (such as Blackpool and Bradford) also receive above average levels of support. As well as highlighting individual examples, it is also helpful to estimate the aggregate statistical relationship between the local level of fuel poverty support provided and our holistic measure of underlying need in each local authority. This provides a quantitative indication of the extent to which current support schemes are targeted.

The scatter plot presented below shows the level of correlation between local authority need (horizontal axis) and the level of support provided (vertical axis). Each point represents a particular local authority and illustrates their level of fuel poverty risk (local authorities which are further to the right are at higher risk) and the level of support they receive (local authorities which are higher receive relatively more support).

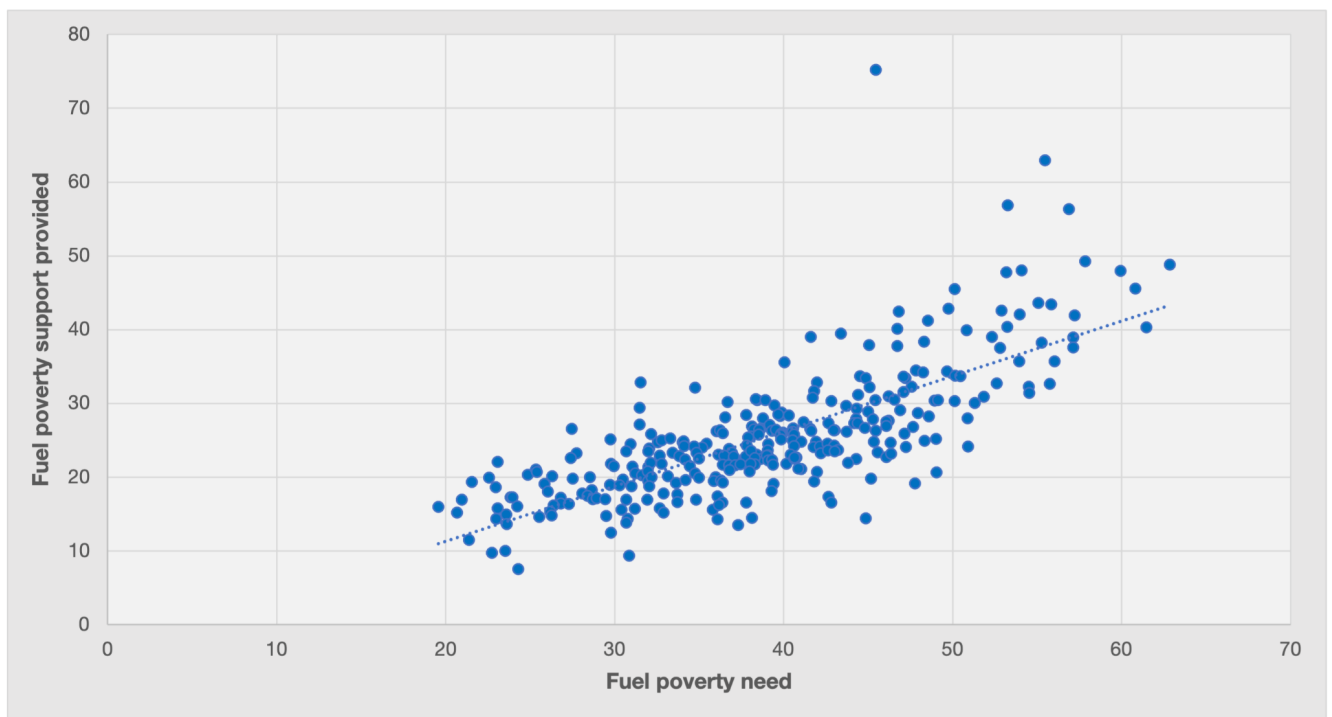


Figure 16: Correlation between fuel poverty need and fuel poverty support provided

Overall, we observe a statistically significant positive correlation between level of support provided and overall potential for fuel poverty within each local authority. This means that, on average, local authorities with a higher risk of fuel poverty do receive more support. Therefore, the support schemes we examine are being targeted more on households living in areas of relatively high need. However, there is significant room for improvement and our analysis can highlight how this improvement can happen.

Overall, 16% of local authorities receive a below average level of support despite having an above average risk of fuel poverty. There are several local authorities which stand out as apparent outliers. For example, households in areas such as Hackney (London), Barrow-in-Furness (North West) and Lincoln (East Midlands) all receive relatively low levels of support given their risk of fuel poverty.

This discrepancy is driven by a range of factors. For example, some fuel poverty support mechanisms rely on benefit receipt to identify fuel poor households and we know that this is an imperfect proxy for need.⁷² In other cases, households with the greatest need may not be fully aware of the support that is offered, which means they do not apply and therefore do not receive the help they are entitled to. Finally, the eligibility criteria for certain support mechanisms (eg Winter Fuel Payments) are not based on ability to pay or demand for fuel. This will limit the effectiveness of these support schemes.

⁷² The Committee on Fuel Poverty has noted that relying entirely on benefit receipt as a proxy for fuel poor households has two major deficiencies. Firstly, 46% of fuel poor households were not in receipt of qualifying benefits in 2021. Secondly, it is not known whether households in receipt of benefits had high heating costs. Committee on Fuel Poverty (2021), 'Annual Report', <https://www.gov.uk/government/publications/committee-on-fuel-poverty-annual-report-2021>

5. Conclusion

Our work makes a significant contribution to the understanding of local area fuel poverty and the limitations in our data infrastructure around this challenge. We have also quantified, for the first time, the extent to which support schemes are effectively targeted using a holistic fuel poverty indicator. Our conclusions highlight the scale of the current challenge. They provide an open data asset that can be used to inform future decisions and help to partially address some of the current problems facing service providers and policymakers.

Summary of our work

Fuel poverty is a major problem. It causes considerable hardship and negative health impacts, as well as impeding efforts to reduce carbon emissions.⁷³ It hampers the ability of significant sections of the population to live their lives well and to fulfil their potential; including the capacity to contribute to the economic health of the country. Access to a safe and warm home is an essential precondition for living a healthy and productive life. Recent rises in energy costs (combined with broader cost of living concerns) will increase the scale of fuel poverty and further emphasise the importance of addressing its negative impacts in an effective and efficient way.

Our analysis presents a detailed data-informed picture of fuel poverty and at-risk groups such as renters, households containing children and young adults, and households with lower incomes. We have also highlighted that households living in the North East, North West and Yorkshire and the Humber have the highest potential for fuel poverty according to our updated fuel poverty risk index.

Fuel poverty prevalence across these groups does not necessarily imply that the same magnitude or type of support is needed. For example, average rates of fuel poverty are approximately equal across rural and urban areas. However, those that are fuel poor in rural areas require a larger reduction in fuel costs when compared with urban households who are in fuel poverty.

To adequately address this complexity and fuel poverty issues in a nuanced way, we note that the data infrastructure for fuel poverty should allow for:

- consideration of a wide suite of metrics to ensure the full scale of the issue is being recognised
- sharing of more recent data to enable the current challenge to be tracked in a more timely manner; current official fuel poverty statistics are based

⁷³ Hills Fuel Poverty Review (2012), 'Getting the measure of fuel poverty', https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/48297/4662-getting-measure-fuel-pov-final-hills-rpt.pdf

on data collected in 2020, which limits the ability of policymakers to use this information to inform decision-making

- collection and/or creation of granular data assets, at local authority level, which can inform day-to-day decisions made by policymakers, service providers and charities
- explicit comparisons of those in receipt of fuel poverty support and those at risk of fuel poverty (using a holistic set of metrics).

These issues may mean we are missing out on some rich insights that could help to address fuel poverty. Our fuel poverty risk index makes an important contribution to filling the gaps highlighted above. We used a variety of indicators to measure both local area demand for fuel (based on metrics such as housing quality and climate patterns) and local area ability to pay for fuel (based on income and deprivation metrics). We combined the results from these two domains to create an overall index risk score for each local authority. This provides a robust and comprehensive indication of the extent of fuel poverty across England.

Significantly, and something not previously done, we have produced a local authority score which represents the level of support that the government is providing in specific local areas. Comparing this score to the underlying measure of fuel poverty in each local area allows us to assess the overall success of government support in targeting those most in need.

Overall, we observe a positive correlation between local authority need and the level of support provided. However, there is room for improvement going forward to ensure that support is targeted effectively. As noted above, some of the information which feeds into our updated index is not fully up to date and our analysis has not been able to consider the extent to which the Energy Price Guarantee (post-April 2023) is well targeted. More data and better data infrastructure in this context will therefore be vital to assess targeting of support going forward.

Next steps

Policymakers, providers, energy companies and others who deliver support for those experiencing fuel poverty, and those experiencing fuel poverty themselves, can use the insights contained in this report to inform design of future initiatives. The local area tool and supporting dataset that we have published alongside this report can be used to understand fuel poverty in detail within specific localities and help to highlight areas that might need urgent additional attention.

The ODI has committed to maintaining the fuel poverty risk index and carrying out a full update in 2023. We want to ensure that the next iteration of the fuel poverty risk index will add further value. It could include:

- insights from individuals who are currently experiencing fuel poverty on what additional factors might provide an indication of unmet need
- a wider set of indicators in our aggregate fuel poverty measure; these indicators could be sourced from a range of organisations and individuals, including charities and community-based organisations that

provide services locally or across the country to help households experiencing fuel poverty

- analysis of how targeting of publicly provided support changes over time in the face of the cost of living crisis
- considering the impacts on non-domestic energy customers as well as households.

In order for our fuel poverty risk index to continue to develop and add value in the future, the government could consider whether publication of data on fuel poverty prevalence, drivers and impacts could be done on a more timely basis. In addition, there may be value in greater coordination across the constituent nations of the UK to make a consistent set of indicators available.

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Annex 1: Stakeholders consulted

| Stakeholder organisation |
|-----------------------------------|
| Age UK |
| Child Poverty Action Group (CPAG) |
| Citizens Advice |
| End Fuel Poverty Coalition |
| Generation Rent |
| Kamma |
| London Housing Panel |
| Mumsnet |
| NUS |

Annex 2: Fuel poverty risk index

In order to calculate an indicator of the risk of fuel poverty across the country, we selected 12 measures that provide indirect information on households' demand for fuel and their ability to pay for that fuel. Each measure was given a weighting of high, medium or low, driven by its relevant importance and the quality of the data. These measures make up the two subdomains of the index – 'Demand' and 'Ability to pay'. Details on these measures, including the latest year of data available and their weighting, are summarised in the tables below.

| Measure | Latest year | Weighting |
|--|-------------|-------------|
| Average minimum monthly temperature of nearest weather station since 2013 | 2022 | High (x2) |
| Percentage of dwellings with an EPC below C | 2021 | High (x2) |
| Number of local authority owned dwellings without a reasonable degree of thermal comfort | 2021 | Low (x0.5) |
| Percentage of the population aged 65 or over | 2021 | Medium (x1) |
| Percentage of households containing 4 or more people | 2011 | Medium (x1) |
| Personal Independent Payment cases as a proportion of total population | 2022 | Medium (x1) |
| Average distance from a supermarket or general store | 2018 | Low (x0.5) |
| Average distance from a GP | 2019 | Low (x0.5) |

Table A2.1: Demand subdomain measures

| Measure | Latest year | Weighting |
|--|-------------|-------------|
| Median gross annual pay | 2021 | Medium (x1) |
| Income Deprivation Affecting Older People Index (IDAOPI) | 2019 | Medium (x1) |

| | | |
|--|------|-------------|
| Universal Credit claimants as a proportion of total population | 2022 | Medium (x1) |
| Percentage of households led by a lone parent | 2011 | Medium (x1) |

Table A2.2: Ability to pay subdomain measures

We calculated values at the Local Authority District (LAD) level, as this is the smallest geographic level for which most relevant data is available, using the 2021 boundaries. There are 309 LADs across England, made up of 36 metropolitan boroughs, 32 London boroughs, 181 two-tier non-metropolitan districts and 58 unitary authorities, as well as the City of London and Isles of Scilly. In the few cases where data did not exist for the 2021 LADs, usually due to boundary changes, we used data from relevant historical areas to fill in the gaps. For example, where LADs had been created from a combination of smaller areas, we summed the values from those smaller areas. The City of London and Isles of Scilly were excluded from the index scores due to their very small populations.

For each measure, the value per LAD was normalised using min-max normalisation; in other words, the values were rescored, so they were on a scale from 0 to 100, with 0 indicating the best score and 100 the worst. This allowed us to calculate scores across the measures, despite them having different initial scales and units of measurement.

We weighted certain measures by multiplying the score by either 0.5, for measures that were considered less important; or 2, for measures that were considered more important. All other measures were given a weighting of 1.

An average score was taken for each subdomain of the index – ‘Demand’ and ‘Ability to pay’ – by calculating the mean score across the relevant weighted measures. A high score on the ‘Demand’ subdomain indicates a high level of demand for fuel in that LAD, while a high score on the ‘Ability to pay’ subdomain indicates a low ability to pay.

While the possible range of values extends from 0 to 100, the actual range of values was much narrower. This is because no LAD scored either the worst or best across every measure. Instead, the best score for ‘Demand’ was 13.1 (Tower Hamlets) and the worst score was 67.7 (Eden). For ‘Ability to pay’, the best score was 6.4 (Fareham) and the worst score was 75.3 (Barking and Dagenham).

The overall score for the fuel poverty risk index was calculated by taking the mean of a LAD’s ‘Demand’ score and ‘Ability to pay’ score. This attempts to combine the impact of living in an area with a high demand for fuel with the impact of having a lower ability to pay for this fuel. The highest score was 62.9 (Blackpool) and the lowest score was 19.6 (Wokingham).