

Administrative Data Research Centre Wales  
Data Science Building  
Swansea University  
Singleton Park  
Swansea  
SA2 8PP

For general enquiries please call +44 (0) 1792 606918  
or to speak to a member of the Research Support Team call +44 (0) 2920 870928

ADRCWales@Swansea.ac.uk www.adrn.ac.uk @ADRCWales



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Data Brief 8: Fuel Poverty  
Intervention Data in Wales

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This data brief introduces fuel poverty in Wales, before outlining key information relating to specific home energy efficiency interventions carried out by the Welsh Government. Administrative data relating to home energy efficiency interventions can be used to explore fuel poverty in Wales. This data brief provides an overview of the data that are potentially accessible through the Administrative Data Research Centre Wales (ADRC-W).

Mae'r nodyn data hwn yn cyflwyno tldi data yng Nghymru, cyn amlinellu gwybodaeth allweddol sy'n ymwneud ag ymyriadau penodol ym maes effeithlonrwydd ynni cartref gan Lywodraeth Cymru. Gellir defnyddio data gweinyddol sy'n ymwneud ag ymyriadau ym maes effeithlonrwydd ynni cartref i archwilio tldi tanwydd yng Nghymru. Mae'r nodyn data hwn yn darparu trosolwg o'r data a allai fod ar gael drwy Ganolfan Ymchwil Data Gweinyddol Cymru.

### Fuel poverty in Wales

There is no single definition of whether or not a household is deemed to be living in fuel poverty. In Wales, fuel poverty is a term used to describe a situation where more than 10% of a household's net income (including Housing Benefit) is spent on energy costs to heat a home to an 'adequate' standard<sup>1</sup>. Those households that have to spend 20% or more of their income on energy costs are defined as being in 'severe fuel poverty'. The most recent figures published by the Welsh Government, based on estimates derived from the 2008 Living in Wales Property Survey, estimated that approximately 291,000 households were experiencing fuel poverty in 2016 in Wales. This represents just under a quarter (23%) of all households in Wales<sup>2</sup>. The key factors that increase the risk of a household being in fuel poverty are the energy efficiency of the property, the cost of fuel, and levels of household income<sup>3</sup>.

There are a variety of reasons that may account for levels of fuel poverty in Wales. Low levels of household income in areas characterised by high levels of deprivation will contribute to households in these areas spending a higher proportion of their income on fuel. The rurality of Wales is also associated with increased fuel costs, more severe weather conditions, and older housing stock that is more likely to be characterised by a lack of insulation and inefficient heating systems.

The remainder of this data brief provides an overview of some of the administrative data sets that relate to home energy efficiency measures provided by Welsh Government under its fuel poverty schemes, and which could be used in the analysis of fuel poverty in Wales. Specifically, these administrative data can be used to examine the energy efficiency of the housing stock in Wales, and can be linked to other data to explore the effects of home energy efficiency interventions.

### Overview of home energy efficiency interventions in Wales

In a bid to tackle fuel poverty within Wales, a series of Welsh Government-led initiatives have been developed (See Table 1)<sup>4</sup>, starting in 2000 with the Home Energy Efficiency Scheme (HEES). HEES offered home energy efficiency improvements to low income and vulnerable households most affected by fuel poverty. These measures included insulation, heating upgrades and fuel switching in order to reduce carbon emissions and improve the energy efficiency of eligible households.

In 2011, the HEES scheme was phased out and replaced by a new flagship fuel poverty programme, Warm Homes Nest. The eligibility criteria under Warm Homes Nest were stricter than under HEES, with improvement measures available only to households in receipt of certain means-tested benefits also living in very energy inefficient homes. Non-qualifying households were able to access advice, information and referrals to other schemes and organisations. The Warm Homes Nest scheme has been complemented by the Arbed programme (Arbed and Arbed 2). Arbed was established in 2009 to support landlords in making energy efficiency improvements to social housing.

Table 1: Timeline of home energy efficiency scheme coverage in Wales

	2000	2008	2009	2010	2011	2012	2013	2014	2015
HEES	→								
Arbed									
Warm Homes Nest									

<sup>1</sup> Welsh Assemblage Government (2010) Fuel Poverty Strategy 2010. Cardiff: Welsh Assembly Government

<sup>2</sup> Wilton, J (2016) The Production of Estimated Levels of Fuel Poverty in Wales: 2012-2016. Cardiff: Welsh Government

<sup>3</sup> Department of Energy & Climate Change (2013) Annual Report on Fuel Poverty Statistics 2013. London: Department of Energy & Climate Change

<sup>4</sup> National Assembly for Wales (2011) Fuel Poverty: Quick guide. Cardiff: National Assembly for Wales

## Administrative data relating to fuel poverty interventions in Wales

Administrative data relating to some of these home energy efficiency schemes includes details such as the date of installation/intervention, measure category, and the type of measure installed. Data relate to households rather than individuals, and a household may have multiple records if multiple improvement measures have been implemented.

The different measures/interventions contained in the HEES and Warm Homes Nest data are presented in Table 2 and 3, respectively. Both HEES and Warm Homes Nest provided/provide heating and insulation interventions, however HEES also provided interventions relating to microgeneration. The majority of HEES interventions were related to increasing the energy efficiency of properties through insulation. In contrast, the majority of Warm Homes Nest interventions, to date, relate to improvements to heating systems.

As an indication of the potential sample size for analysis, between 2000 and 2012, approximately 490,000

households in Wales were in receipt of energy efficiency interventions under the HEES scheme. These households were in receipt of roughly 693,000 individual energy efficiency measures (Table 2). The Warm Homes Nest scheme provided around 21,500 home energy efficiency measures to around 18,000 homes in Wales between April 2011 and March 2015 (Table 3)<sup>5</sup>.

Information on a household's eligibility for schemes is not available, and only those households who have received home energy efficiency improvements are recorded. It is therefore not possible to identify households that were eligible for the scheme but have not yet received an upgrade.

Table 2: Energy efficiency measures undertaken as part of HEES, 2000-2012

Category	Measure type	Number of measures
Heating	Condensing Boilers	48,306
	Control Measures	
	Fuel Switching	
	Heating Measures	
	Solid Fire Conversion Cassette	
Insulation	Cavity Wall Insulation	557,850
	Draught Proofing Measures	
	Hot Water Tank Insulation	
	Loft Insulation Measures	
	Solid Wall Insulation	
Microgeneration	Air Source Heat Pump	2,823
	Ground Source Heat Pump	
	Solar Heating Measures	
	Solar PV Panels	
	Solar Water Heating System	
Other	Real Time Display Measures	84,084
<b>Total</b>	<b>6,554</b>	<b>693,063</b>

Table 3: Different home improvement measures installed by the Warm Homes Nest scheme, 2011-2015

Category	Measure type	Number of measures
Heating (including full system replacement)	Boiler replacement	18,354
	Solid Fuel Boiler	
	Biomass Boiler	
	Air Source Heat Pump	
	Solar	
	Electric Storage Heating Full system	
Insulation	Cavity Wall Insulation	3,219
	External Wall Insulation	
	Solid Wall Insulation	
	Loft Insulation	
	Cylinder Insulation	
	Draught Proofing	
<b>Total</b>	<b>6,554</b>	<b>21,573</b>

## Energy Performance Certificate (EPC)

The energy efficiency rating of a property can be determined through its EPC, which is required whenever a property is built, sold, or rented, and is valid for 10 years. An assessment is carried out to establish the property's energy use and costs, which results in an energy efficiency rating from A (most efficient) to G (least efficient) being assigned to that property.

The EPC data contains information relating to each property in Wales for which an EPC has been produced. This includes one record per EPC meaning that multiple records may exist for one property if it has undergone several assessments. The dataset contains information relating to the property type, number of rooms, the energy efficiency of the property's walls, roof and windows, and the energy rating given to the property following the inspection.

The key variables obtainable from the EPC's describe the property characteristics (e.g. property age, property type, property tenure and details of glazing and walls) along with

its number of habitable and heated rooms, and the number of open fireplaces in the property. In terms of energy performance, the dataset contains a separate indicator for windows, walls and roof efficiency, which are rated on a scale from 'Very Poor' to 'Very Good'. This information is recorded alongside the date and reason for inspection such as new dwelling, sale or rental.

Providing an energy performance inspection has been carried out, linking EPC and HEES data provides a complete picture of a property's home energy efficiency. The data does not contain any details about the residents of those properties. However, each record in the HEES data can be attributed with a unique household identifier, which can be used to distinguish between properties. This unique identifier, or Residential Anonymous Linking Field (RALF)<sup>6</sup>, can be linked to other datasets available through ADRC-W to examine further characteristics relating to the property and its residents.

<sup>5</sup> Rodgers, S.E., Lyons, R.A., Dsilva, R., Jones, K.H., Brooks, C.J., Ford, D.V., John, G. and Verplancke, J. (2009) Residential Anonymous Linking Fields (RALFs): a novel information infrastructure to study the interaction between the environment and individuals' health. *Journal of Public Health*. 31(4):582-588

<sup>6</sup> Welsh Government (2016) The Fuel Poverty Data Linking Project. Cardiff: Welsh Government

## Previous research using data relating to fuel poverty interventions in Wales

Data linkage demonstration projects have recently been carried out by Welsh Government, drawing on both HEES<sup>7</sup> and Warm Homes Nest<sup>8,9</sup> intervention data. Various health data sets were linked with HEES/Nest to assess whether the schemes affected the health outcomes of those people resident in households that have undergone improvements.

These linkage studies, drawing on HEES and Warm Homes Nest data, used groups of individuals in receipt of energy interventions taken at different points in time. This method created comparison groups that were presumably living in energy efficient homes (i.e. those which were eligible in the future), but had not yet received any interventions. By using this method of constructing a retrospective control group, future studies could compare other outcomes of households and individuals living in fuel poverty. For example, it could be used to compare educational outcomes amongst young people living in fuel poverty, compared to those after intervention, whose housing conditions have been improved through the intervention.

Further examples of previous research utilising home energy intervention data includes an evaluation of the spatial variations in HEES uptake in Wales<sup>10</sup>, and the impact of home energy efficiency interventions on energy use by recipient households, drawing on similar interventions undertaken in England<sup>11</sup>.

## Related data

The Department of Energy and Climate Change (DECC) have collected and published energy consumption data since 1948<sup>12</sup>. To help support policy development, the DECC have created the National Energy Efficiency Data-Framework (NEED). The NEED is a household level dataset combining several years of data (2005 – 2012) for just over 4 million households in England and Wales. Data contained in the NEED include, for example: information on the property (size, date), EPC rating, energy consumption, dates of any home energy efficiency interventions (loft insulation, boiler, cavity wall insulation), and an indicator of whether the household was in fuel poverty. In Wales, the NEED has data relating to roughly 210,000 households, between 2005 and 2012. NEED data are available in an anonymised format as a single dataset from the UK Data Archive (Study Number 7518).

The Administrative Data Research Centre Wales (ADRC-W) is one of four UK centres that along with the Administrative Data Service make up the Administrative Data Research Network (ADRN). The ADRN provides a safe, secure and transparent data linkage service for accredited, approved research using de-identified UK administrative data.

ADRC-W does not hold datasets. It works closely with government departments to make them available to researchers but this is negotiated on a case by case basis.

This report may be cited as: ADRC-W (2017) Fuel Poverty Intervention Data in Wales. Administrative Data Research Centre Wales, Data Brief No. 8.

This report, along with other titles in this series is downloadable free from ADRN at <https://adrn.ac.uk/about/network/wales/resources/> or by emailing [ADRCWales@Swansea.ac.uk](mailto:ADRCWales@Swansea.ac.uk).



<sup>7</sup> Lowe, S. (2013) Data Linking Demonstration Project: Examining Fuel Poverty using Home Energy Efficiency Data (HEED) and routinely collected Health Data. Cardiff: Welsh Government

<sup>8</sup> Welsh Government (2016) The Fuel Poverty Data Linking Project. Cardiff: Welsh Government

<sup>9</sup> Welsh Government (2017) The Fuel Poverty Data Linking Project Findings Report No.1: Initial Findings on the Impact on Health of the Warm Homes Nest Scheme. Cardiff: Welsh Government

<sup>10</sup> Baker, W. and Preston, I. (2006) Targeting energy efficiency resources in Wales. Bristol: Centre for Sustainable Energy

<sup>11</sup> Hamilton, I.G., Summerfield, A.J., Shipworth, D., Steadman, J.P. Oreszczy, T. and Lowe, R.J. (2016) Energy efficiency uptake and energy savings in English houses: A cohort study. *Energy and Buildings*. 118:259-276

<sup>12</sup> <https://discover.ukdataservice.ac.uk/catalogue/?sn=7518>