



Warm Homes Fund Programme Evaluation

Executive Summary

May 2023



Action for Warm Homes



Introduction

Funded by National Grid and administered by Affordable Warmth Solutions (AWS), the Warm Homes Fund (WHF) was one of the largest fuel poverty programmes to be delivered in Great Britain, representing private sector investment of £150mn. The programme has been evaluated by a consortium made up of Newcastle University, National Energy Action (NEA), and Energy Audit Company (EAC), with support from academics at University of Bristol. This summary presents the

key findings of the evaluation. The full findings of the evaluation, as well as a shorter summary report, are published separately.

Also published separately is a detailed blueprint for the future design and delivery of fuel poverty and energy efficiency programmes. This blueprint summarises the main findings of the evaluation and makes recommendations as to how fuel poverty and energy efficiency schemes should be designed in the future, including the core guiding principles that they should aim to follow.

Energy and environmental modelling

The evaluation used pre- and post-improvement Energy Performance Certificate (EPC) data and project returns data from the WHF, to produce modelling of households' fuel poverty status, required running costs, and fuel poverty gap before and after the installation of new heating systems. Where applicable, it also identified any other improvement measures provided to beneficiary homes. The total number of modelled homes was 15,690 from a total of 27,239 homes improved via the Programme, and the key findings are as follows:

- The average SAP rating of the dwellings before any improvements were made was approximately 51, corresponding to SAP band E. This is considerably lower than the national average, which is around 60. **After making improvements the average rose to 68, one point below band C.** The main effect is movement from the E, F and G bands into the C and D bands.
- **Before making improvements, 6,428 homes (41%) had annual running costs above £2,000. Post-intervention, the number of homes with**

over £2,000 running costs fell by over 90% to 460. In terms of averages, the mean annual running costs dropped from £2,011 to £1,089 – in other words, **on average the installation of a new heating system saved households £922 per year.** This was based on a fuel prices figure calculated prior to the beginning of the energy crisis in October 2021.

- **Wales has the largest range of cost savings, and the highest median net cost saving per year.** Savings are also comparatively high for Orkney and North East Scotland. This potentially reflects the greater impact that can be achieved when rural communities, typically characterised by older and less efficient housing stock occupied by those on lower incomes, are targeted.
- Although there were approximately 5,500 homes (35%) that remained in fuel poverty (as defined by the Low Income Low Energy Efficiency (LILEE)¹ metric) after improvements were made, **the average fuel poverty gap (the energy bill reduction that a fuel-poor household would need in order not to be fuel poor) dropped sharply from £699 to £121. This means that on average, where a households remained fuel poor, their annual required running costs dropped by almost £600, greatly reducing the severity of fuel poverty.**

- **Average CO2 emissions per property across all modelled homes did not appreciably change. Findings show that they increased by a negligible sum of 3 kg/yr, from 2,746 kg/yr to 2,749 kg/yr.** This can be explained by the balance of measures installed through the WHF. The majority of heating systems that were replaced were electrically powered, predominantly storage and room heaters, and the majority of new systems were gas boilers. The electricity grid has decarbonised rapidly over recent years, and electrical systems therefore emit less carbon than gas ones. However, the match-funded installation of insulation measures and air source heat pumps (ASHPs) through the Category 2 arm of the WHF has decreased emissions, thereby counterbalancing the WHF's overall impact on average domestic CO2 emissions. **It should be noted that this is still significantly below that of the average UK home, which emits approximately 3,644 kg/yr of CO2.**
- **To improve all 5,500 remaining fuel-poor households in the modelling dataset to EPC Band C, the total required amount of investment is £33,308,058.** As this is based on a sample of 15,690 homes, and to date the WHF programme has improved 27,239 homes, the extra required spend to eliminate fuel poverty across the entire project is estimated to be £57,825,251. However, in some cases this is not cost-effective, and a more workable solution that eliminates fuel poverty for some households is to permanently increase their income or reduce their energy bills through one means or another (e.g., through increases to social security payments, or the introduction of a social tariff in the energy market).
- **Affordable Warmth Benefits and Fuel Poverty pathways were the most successful at targeting fuel-poor households,** whereas ECO Flex, which is defined by local authorities and consequently varies across different geographical administrations, and Index of Multiple Deprivation (IMD) pathways, were much less successful, as shown below.²

Eligibility criteria	Fuel poor (LILEE)	Not fuel poor (LILEE)
Affordable Warmth Benefits	96%	4%
ECO Flex	32%	68%
Fuel Poverty	87%	13%
IMD	31%	69%

2. The eligibility criteria used by the WHF are as follows: 1) affordable warmth benefits, whereby one or more of the household occupants is in receipt of a means-tested benefit; 2) ECO flex, whereby the household qualifies for assistance through meeting the local authority's flexible eligibility criteria; 3) fuel poverty, whereby the household has had a fuel poverty assessment carried out; 4) Index of Multiple Deprivation, whereby the household is located in a Lower Super Output Area which is in the top 25% of most deprived areas in the country. Note that the 'fuel poverty' pathway does not map exactly to the LILEE definition of fuel poverty utilised in the energy modelling analysis. This is because of the different methods used by WHF projects to calculate the eligibility for the 'fuel poverty' pathway, as well as the way in which the energy modelling analysis assumes and calculates income and energy efficiency.

1. Fuel poverty in England is measured using the Low Income Low Energy Efficiency (LILEE) indicator, which considers a household to be fuel poor if: a) it is living in a property with an energy efficiency rating of band D, E, F or G as determined by the most up-to-date Fuel Poverty Energy Efficiency Rating (FPEER) Methodology; and b) its disposable income (income after housing costs (AHC) and energy needs) would be below the poverty line.

Social, economic, and health impacts of the programme

The outputs of the energy modelling analysis were used to inform an analysis of the WHF's broader economic impact. Using a Social Accounting Matrix developed by researchers at Strathclyde University, the evaluation team were able to conduct modelling of the economic impact of a) the transfer of capital from National Grid into the housing, construction and installer sector, as well as the support services sector; and b) the spending of any additional income obtained by households through reductions in their required running costs and subsequent energy bills. The movement of homes into higher SAP bands post-intervention was also used to calculate the savings to the National Health Service (NHS) due to WHF-led improvements, using the Building Research Establishment's Housing Health Cost Calculator.

The main findings of this analysis are:

- Economic modelling shows that from the initial £150mn investment in the construction, retrofit and installer sector, and the support services sector, **an additional £200mn of demand was stimulated in the economy.** This produced a

total economic demand stimulus of £350mn. **This means that for every £1 invested in the WHF, a further £1.34 was stimulated in the wider economy.**

- **The total energy bill savings generated by the WHF, which can be regarded as an increase in household disposable income, was £10.8mn.** As this money was re-spent by households, a **further £14.4mn of spending took place,** demonstrating the positive economic impact of energy bill reductions on the wider economy.
- **Targeting low-income households produces a larger economic impact.** By targeting low-income households, the WHF grants produced a greater boost in demand across the economy than if the funding had been targeted at middle-income households. Analysis shows that **approximately £2mn more demand has been created by targeting low-income households; this arguably justifies spending on fuel poverty alleviation as a means of boosting economic growth.**
- The **total NHS cost savings generated by the WHF are estimated to be £2,491,381 per annum, while the wider societal benefits are estimated at £41,854,679 per annum.**

Impact on beneficiaries

Based on quantitative and qualitative research with WHF beneficiaries, which included 61 interviews with beneficiary households and 999 questionnaire responses, the programme's main impacts on households have been:

- Households reported substantial improvements to thermal comfort. **Pre-intervention, just 18% of households were able to keep their whole homes warm when it was cold outside. Post-intervention, this increased fourfold to three-quarters (76%).**

- Category 1 interventions resulted in the most substantial improvements to self-reported thermal comfort, with an increase of 73 percentage points, from 11% before intervention to 84% after intervention.
- **Changes in running costs have translated into self-reported improvements in energy affordability, especially for beneficiaries of Category 1 interventions.** Just over half (53%) of Category 1 households reported that they find their energy bills a lot easier or a little easier to afford now, compared to before the intervention. 44% of Category 2 households replied the same, as did 40% of Park Homes households and 31% of Category 3 households.

- **Four in five households were living in a home where at least one occupant had a cold-related health condition,** and over half were living in a home where at least one occupant had multiple such conditions. Over half (58%) of households agreed that not being able to keep warm at home affected their physical health, and 44% agreed that it affected their mental health.
- Post-intervention, **48% of households reported that their physical health was better** than before, and 39% of respondents reported that their mental health was better. In interviews, households reported improvements to musculoskeletal and respiratory health, mental wellbeing, and reductions in the prevalence of mould and damp in their homes. Interviews also suggested that the interventions likely prevented the development or exacerbation of health conditions for young children, enabled improvements in diet and nutrition for children and adults, and facilitated safer home environments for beneficiaries with dementia.
- **WHF interventions had a substantially positive impact on the prevalence and severity of rationing practices, such as cutting back on**

heating and not buying essential everyday items, such as food; they also made beneficiaries feel that home environments were homely and safe, rather than alienating or hostile.

- **There were substantial improvements in WHF beneficiaries' ability to use and control their heating systems following their intervention, with 77% agreeing that they felt more able and confident about using and controlling their heating system.** In particular, interviewees with storage heaters in their properties frequently described them as difficult (if not impossible) to control effectively, and solid fuel fires and LPG heating systems were also discussed as near-impossible for beneficiaries to control. Accordingly, the recipients of first-time central heating installations discussed how replacing their storage heaters and solid fuel heating had dramatically improved the control they felt they had over their heating, their energy use and their homes.
- **Energy advice and capital measures interventions, delivered together as part of a single journey for households, resulted in better outcomes for recipients.**

Impacts on WHF projects

Finally, research with WHF projects' delivery partners highlighted four qualitative impacts on the organisations the WHF had funded. These were:

- WHF enabled delivery organisations to establish and expand internal resources, processes, delivery mechanisms, and partnerships.
- WHF contributed to, and in many cases helped, delivery organisations to achieve broader organisational priorities and strategies.

- Learnings obtained through the delivery of their projects enhanced delivery organisations' ability to undertake large-scale energy efficiency and fuel poverty projects in the future.
- WHF unlocked additional resources and supported organisations in applying for and/or securing further funding for fuel poverty and energy efficiency schemes, thus further demonstrating the added value created by the WHF itself.

May 2023

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