

Fuel Poverty Carbon Footprint

Summary Report



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Fuel Poverty Carbon Footprint is a research project looking at the carbon footprints of private householders who have received energy saving measures under a local authority scheme in the East of England. The survey was carried out in the period February to June 2008 by
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The Final Report is available from www.pett-projects.org.uk and from the Eaga Partnership Charitable Trust website.
An Evaluation Report for the project is also available.

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Fuel Poverty Carbon Footprint

Executive Summary

- A survey of 31 households in the east of England that had received measures under LA fuel poverty programmes
- Majority retired, some families and vulnerable households
- Data collected through interviews and case studies to establish carbon footprint using Act On CO₂ calculator
- Five case studies explored other source of emissions and lifestyle issues
- Lowest carbon footprint 1.14; largest 16.64 (tCO₂ yr⁻¹)
- Mean of group 6.12, median was 5.75 (tCO₂ yr⁻¹)
- Carbon footprint lower than control group but not statistically significant
- Four may be in fuel poverty still (June 2008 prices); this does not take account of household temperature regime as included in fuel poverty definition, and income is not precisely measured
- **No evidence of indirect rebound effects; savings in fuel costs do not lead to expenditure on carbon emitting activities or appliances**
- **Amount of carbon savings from measures delivered to this group the same or better than to a higher income group**
- **Hard to treat dwellings (solid wall and/or off the gas network) provide greater carbon emissions reduction on a dwelling for dwelling basis but the cost is higher**

Survey of households

The Fuel Poverty Carbon Footprint project carried out a survey of 31 households in the East of England, all of which had received measures under a fuel poverty programme, although there was no assessment of whether they were in fuel poverty or not before the measures were installed. The majority (21) of the people involved were retired, but some families were involved (8) and many households included vulnerable people (two with long-term sick or disabled, one with children under 3 years old, 18 in the Priority Group based on benefits, 7 more due to age).

Five case studies provided detailed information on other aspects of carbon footprints: water, waste, food and public transport. Resource use was generally low amongst all these subjects. A common theme about social justice may be partly attributable to selection bias.

Objective and purpose

The objective was to collect data to establish the carbon footprint using the Government's Act On CO₂ calculator, and to compare these with national and local averages, in order to determine whether their footprints were any different from the average. The purpose was to add information to the debate on whether fuel poverty programmes run by local authorities conflicted with carbon emissions reduction programmes. At issue was the use of any cost savings from measures, and whether they were used in a way that increased the carbon footprint rather than decreasing it. In policy terms, the project relates to National Indicators 186 and 187 and to research about direct and indirect rebound effects.

Carbon footprints of the sample compared with other groups

The range of carbon footprints discovered was from 1.14 tCO₂ yr⁻¹ to 16.64 tCO₂ yr⁻¹ compared with the national average at 10.2 tCO₂ yr⁻¹. The mean footprint for this group was 6.12 and the median was 5.75 tCO₂ yr⁻¹. The range is shown in Figure 1. The majority of households surveyed had footprints around or below the average for their local authority. Compared to a control group from Herefordshire, the mean was lower than the control group but it was not significantly different. The control group was self-selected by response to an on-line project by the unitary authority in Herefordshire and the survey group was self-selected in that they responded to an invitation to take part. Bias in both groups exists, but may be complementary.

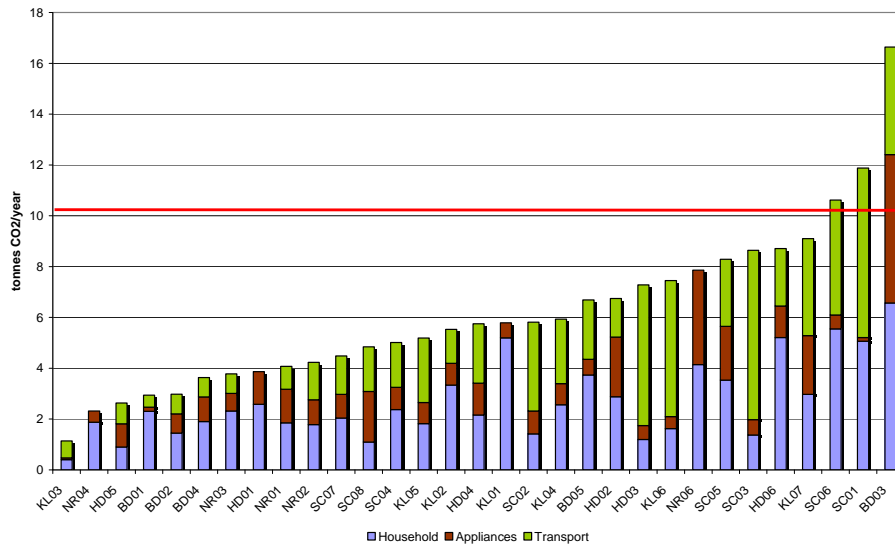


Figure 1: Carbon footprints of the study sample

From this small sample, no conclusions can be drawn whether their footprints are significantly lower than the general population, nor whether the benefits of energy efficiency measures have contributed to a low footprint. However it was identified that the footprint would have been larger had the measures not been installed. This was achieved by analysing the change in fuel bills and calculating the total CO₂ savings attributable to measures installed in this group of dwellings.

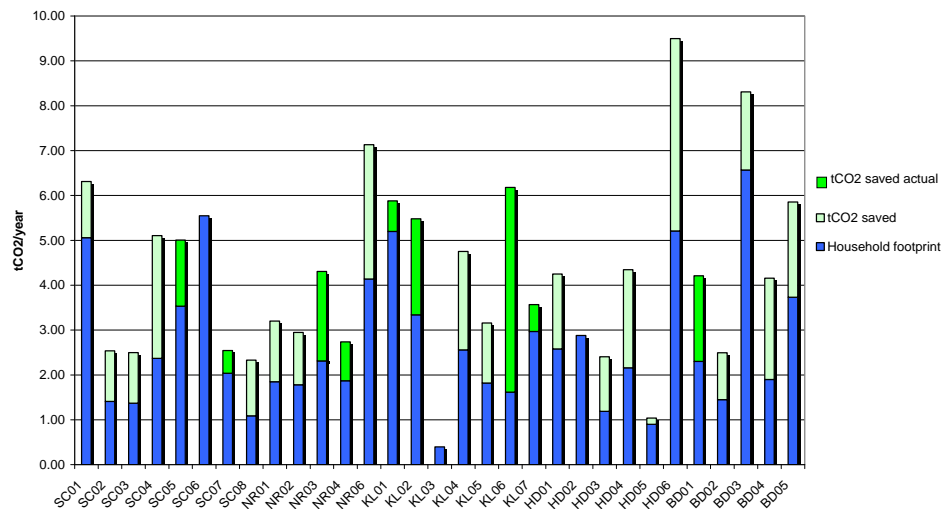


Figure 2: Household carbon footprints before and after measures

Carbon footprints under Act On CO₂ can be divided into three parts: household (heating, lighting and hot water), appliances (including washing, cooking, communication and entertainment appliances) and transport (air travel and personal car use). The average household footprint after measures was 2.68 tCO₂ yr⁻¹, and that before was 4.39, giving an average reduction of 1.71 tCO₂ each year, or 39% (of household only). Taking account of the overall carbon footprint, the reduction is 22% (1.71 on an average 7.83 before measures). The range is shown in Figure 2.

There was no evidence to show that these householders had increased their emissions of carbon dioxide through additional air travel or high energy using appliances such as plasma TVs. Due to the rise in energy bills and costs in general, the lower fuel requirement for heating meant that most households were able to afford to heat and eat, with some but not much ease in worry about bills.

Risk of fuel poverty in the sample

Although many of the data have been drawn from modelling, as detailed fuel bills before the measures were applied were not generally available, there has been a decrease in the number of people at risk of fuel poverty among this group. Income was obtained using a self-select income decile scale so the income used in these calculations is not exact.

For 12 households where actual fuel bills were available 3 were probably in fuel poverty before the measures were applied, one was still in fuel poverty afterwards. Had the measures not been applied a further one of the 12 would have been in fuel poverty now. One would have been paying more than a quarter of her income on fuel, this was a vulnerable person.

Based on current fuel use and costs, 4 out of 30 may be in fuel poverty now, and a further 3 are very close. Of these, 3 are in hard to treat homes and may not be heating them to the standard stated in the fuel poverty definition, and one prefers his home to be kept warmer than the standard, so may technically not be in fuel poverty although he is spending more than 10% of his income on fuel. All but one of these would qualify as Priority Group customers under the energy suppliers obligation (CERT) programme.

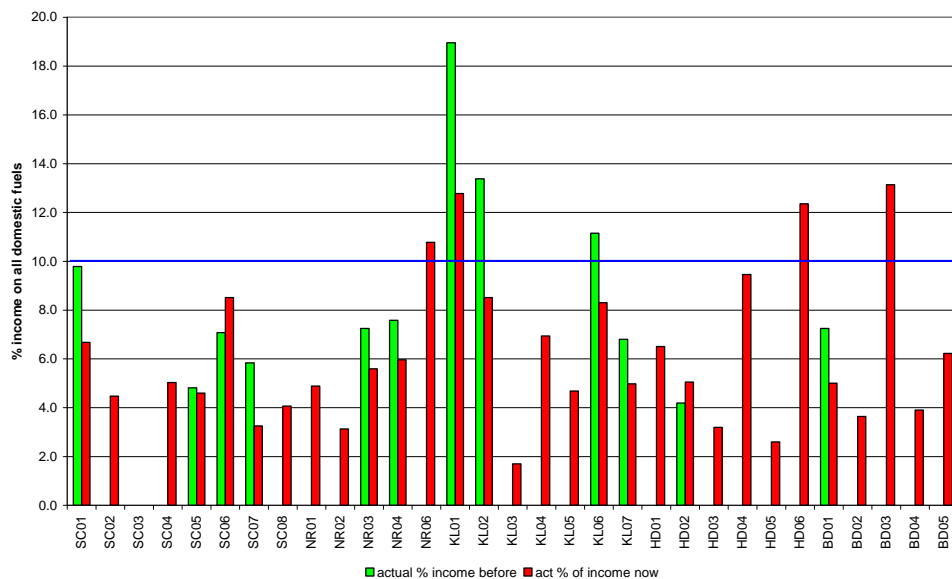


Figure 3: Actual fuel expenditure before and after measures – percentage of income decile

Using modelling on all 31 homes to fill in the gaps, 3 households would have been at risk of fuel poverty plus a further 5 would have been borderline before the measures were installed. Had the measures not been installed, 9 would have been in fuel poverty plus one more borderline. According to the modelling, none of the households are technically now in fuel poverty.

Carbon reduction versus fuel poverty programmes

Based on both actual fuel costs and modelled data, the amount of carbon savings that can be attributed to these 31 households is 47.9 tCO₂ each year. By assessing the measures installed against the Defra assumptions for the CERT programme, the assumed CO₂ savings for the survey households are similar to or greater than the calculated savings under CERT for the same set of measures and cost. This suggests that, provided the costs to the LA are not significantly more than under CERT, the value of delivering these types of measures to households at risk of fuel poverty is the same or better than delivering them to supposedly 'fuel-rich' households. However there is awareness that some of this difference may be due to differences in modelling assumptions.

This suggests that if carbon reduction programmes are a priority to the LA, it is no disadvantage to focus on fuel poor households as the same or better carbon savings are likely to accrue. Whether it is more expensive to deliver the measures depends on how poor is the quality of the house (and therefore the measures needed) in the first place.

Comfort-taking aside, there has been no change in what the subjects do with their lifestyles, although they feel more comfortable about doing it. Although most (80%) respond positively to the statement 'It's been easier to keep warm', at least 20% do not maintain their homes at the recommended temperatures, therefore direct rebound effects may be lower than generally assumed through modelling. More than half agreed that they are 'not so worried about bills'. There is no evidence of indirect rebound effects, i.e. spending the money saved on high-emissions activities or appliances.

Conclusions

The main conclusions from this study are:

- There is no evidence that people who receive measures under a fuel poverty programme are likely to use any money saved to spend on high-carbon emissions products and services. So the rebound effect, if any, does not lead to an increase in carbon footprint.
- Whether this is the case for all types of households requires further study. A robust study using kWh measurements before and after as well as fuel costs could ease the decision making of local authority policy-makers when deciding the focus and funds allocation for housing improvement, fuel poverty eradication or climate change mitigation programmes.
- Further exploration of the value of programmes that improve so-called hard to treat properties – off the gas network and/or with walls that cannot be filled using cavity wall insulation – would be beneficial. The carbon savings and social benefits for vulnerable people in these homes suggest there may be a double benefit and comparatively greater carbon savings than hitherto calculated.