

Fuel Poverty Carbon Footprint

NEA Fuel Poverty Forum 5th March 2009
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Pett Projects

Sustainable energy and buildings research



Purpose of project

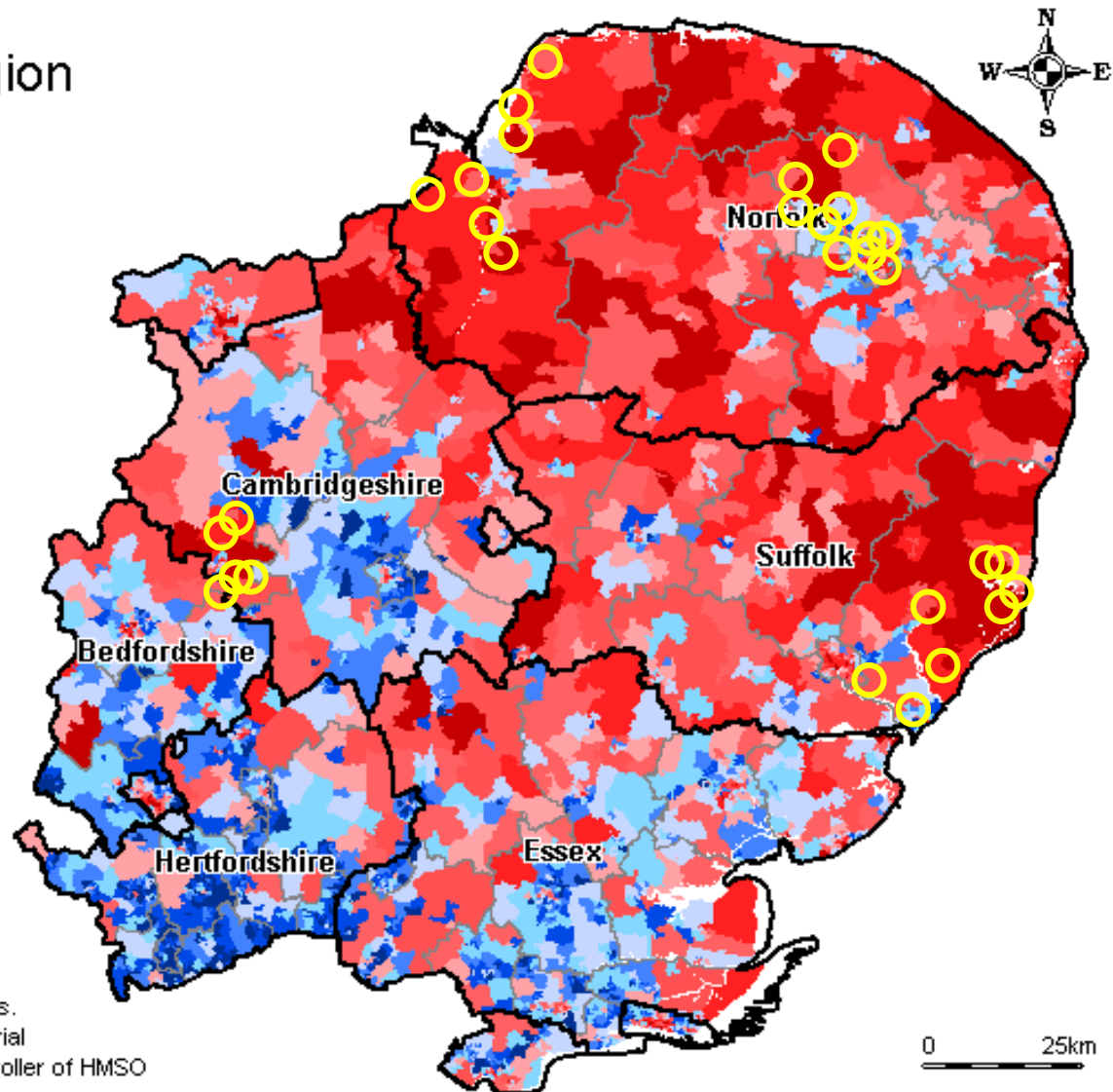
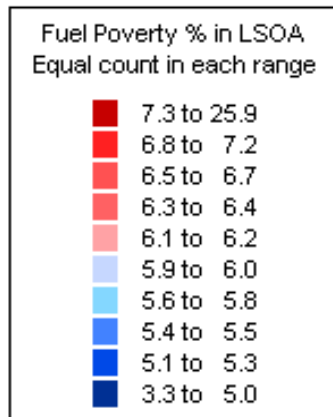
- Issues of concern
 - National Indicators 186 (carbon emissions) vs 187 (fuel poverty)
 - research about direct and indirect rebound effects
 - use of any cost savings from measures
 - whether they increased their carbon footprint
- **Purpose**
 - **inform debate on whether fuel poverty programmes conflict with carbon emissions reduction programmes**
- Objectives
 - collect data to establish the carbon footprint using the Government's Act On CO₂ calculator
 - compare these with national and local averages
 - determine whether their footprints were any different from the average
- Funding body – Eaga Partnership Charitable Trust

Methodology

- Invitation to LAs in East of England :
 - Suffolk Coastal
 - Huntingdon
 - Norwich City
 - Kings Lynn & W Norfolk
 - Broadland
- Participants invited by LAs; letters sent to people who had received measures under LA schemes
- 156 letters sent out: 42 positives; 31 surveyed
- Five case studies carried out including carbon emissions from other sources

Survey coverage

Fuel Poverty in the East of England Region



Data modelled by the University of Bristol and CSE from 2001 Census and 2003 English House Condition Survey

Source: 2001 Census, Output Area Boundaries.
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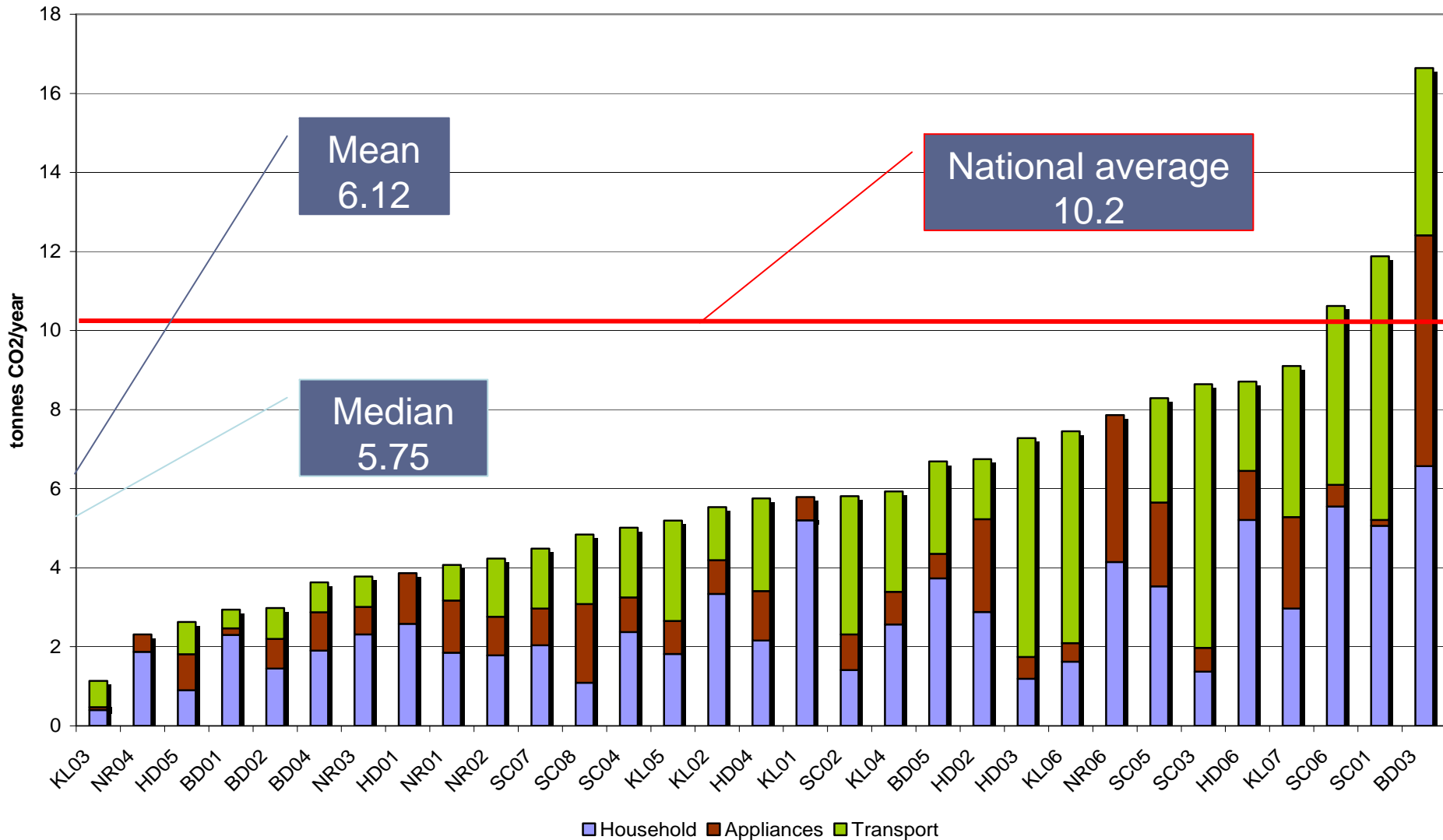
Household types

- 10 one-person households, 13 couples
- 22 pensioner (10 over 75)
- 8 families (1 under 3, 4 under 11, 8 over)
- Vulnerability:
 - Housebound/disabled/long-term ill-health (10)
 - Stroke, arthritis, sight, mobility,
 - Down's syndrome
 - Infants/young children (3)
 - Single parents (5 – 3 now with partners)
 - Pensions & benefits
- 11 in lowest income range (<£181/wk) ; 7 in second

Measures

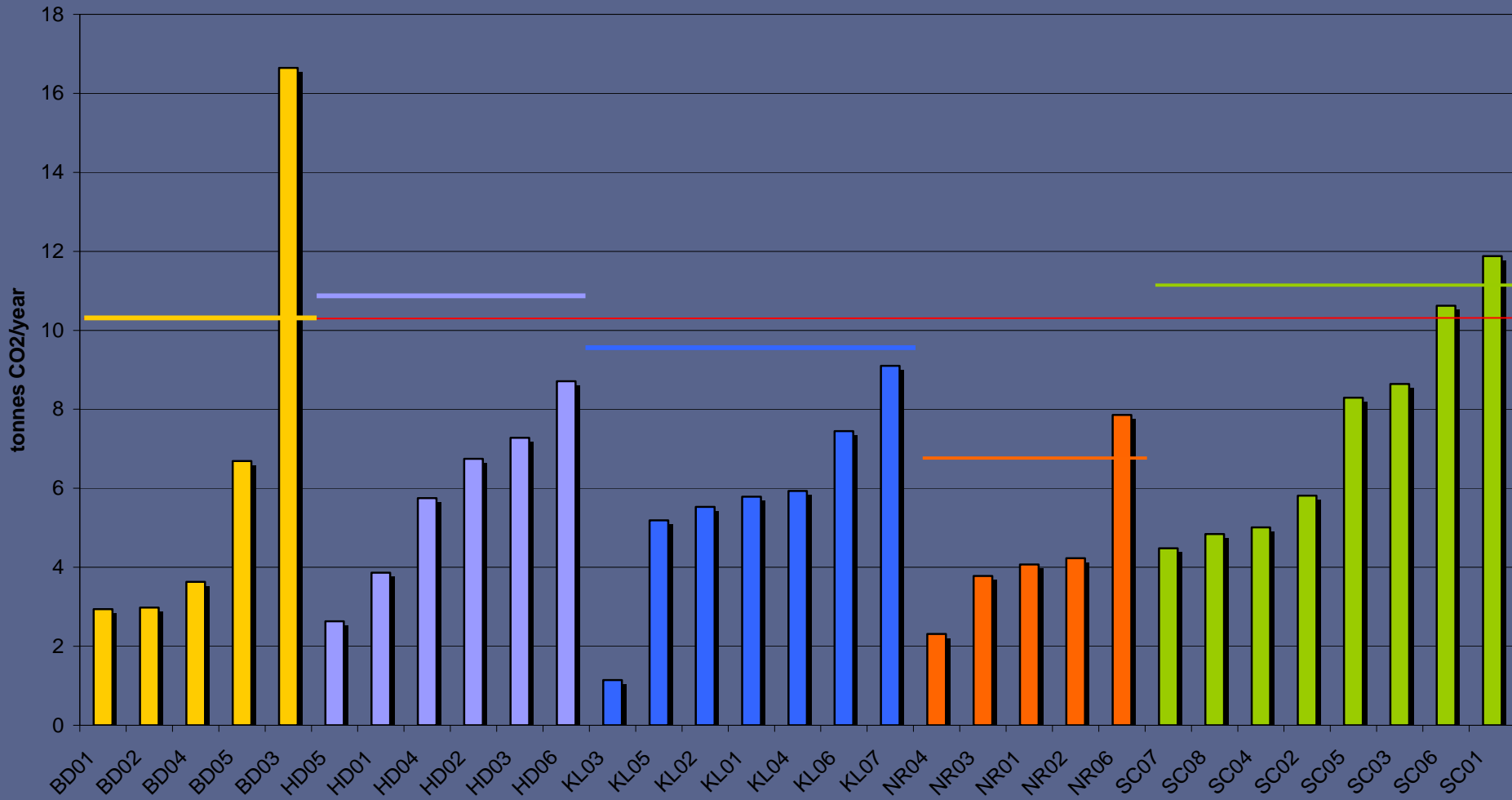
| Before | Number | After | Number |
|----------------------------------|--------|-------------------------------|--------|
| LI, CWI, gas ch | 6 | Plus LTU & Gas CB | 3 |
| | | Gas CB | 3 |
| LI, CWI, electric | 4 | Gas CB + ch | 2 |
| | | Oil CB + ch | 2 |
| LI, CWI, open or solid fuel fire | 2 | Plus Gas CB & open fire | 1 |
| | | Plus oil CB and open fire | 1 |
| LI, CWI, oil boiler | 1 | Oil CB | 1 |
| LI & gas fire | 2 | Plus CWI | 1 |
| | | Plus LTU, Gas CB + ch | 1 |
| LI & gas or oil ch | 8 | Plus internal wall insulation | 1 |
| | | Plus CWI | 2 |
| | | Plus CWI & gas CB | 4 |
| | | Plus LTU & gas CB | 1 |
| LI & electric | 2 | Plus LTU, gas CB | 1 |
| | | Plus CWI, gas CB | 1 |
| Gas ch | 5 | Plus LI, CWI | 3 |
| | | Plus LI, gas CB | 1 |
| | | Plus LI | 1 |
| Gas fire | 1 | Plus LI, CWI, Gas CB + ch | 1 |

Carbon footprints of the group



LA footprints and averages

Footprints by LA



Est. footprints before / after measures

- Household part of footprint measured
 - Heating, hot water, lighting
- Average before measures (based on stated bills and measures installed) 4.39 tCO₂/yr
- Average after measures 2.68 tCO₂/yr
- Av. reduction 1.71 tCO₂/yr
- Compares well with Warm Front measured average 1.2 tCO₂/yr
- Included 5 hard to treat homes in survey
- Gives average 22% reduction on *total* carbon footprint

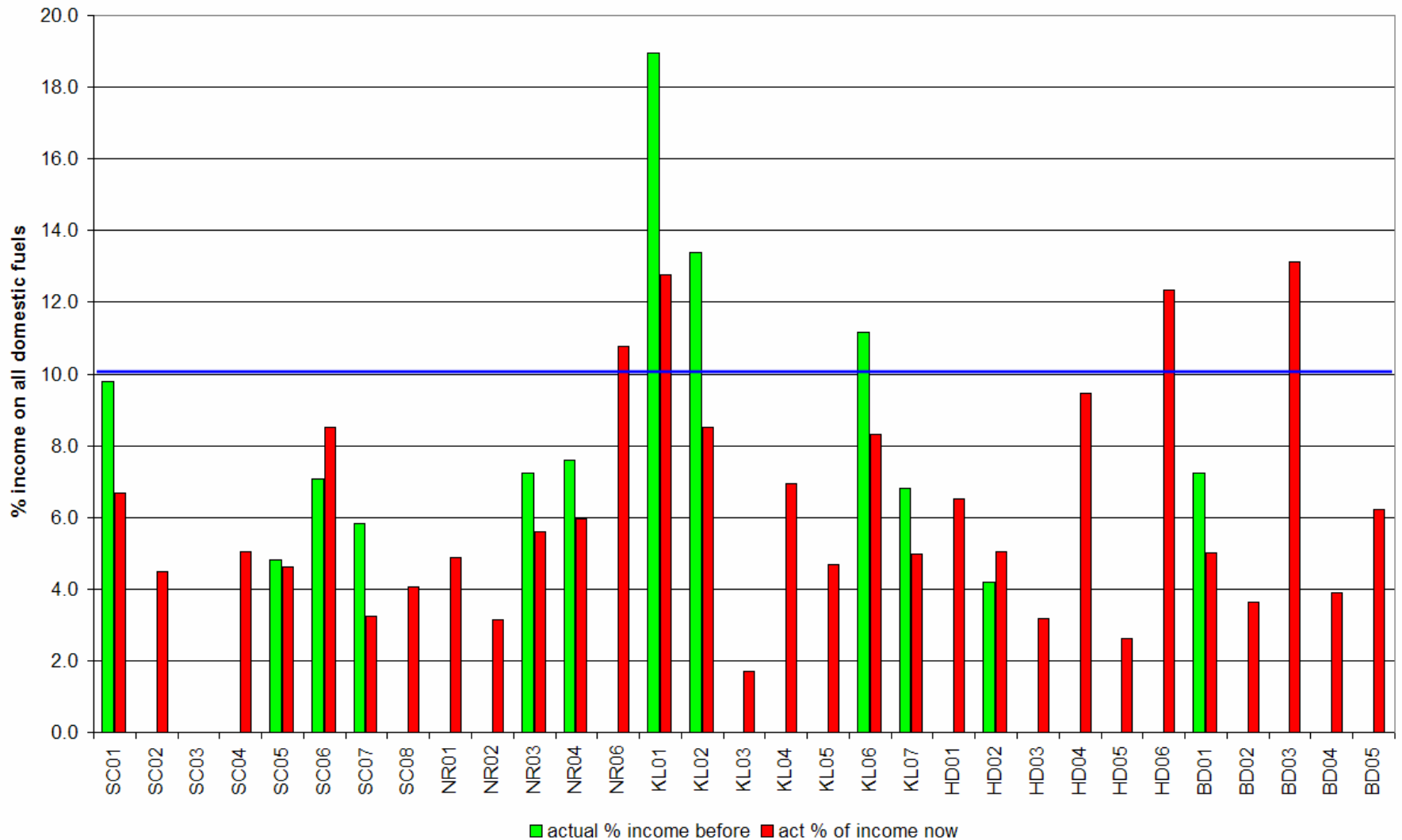
What did they do with their savings

- Average saving for 12 'actual' bills:
 - £200 per year on all fuels before and now
 - £430 per year based on what cost would have been now
- Most were able to afford food and other bills more easily (£4 a week)
- No evidence of 'high carbon' spending such as more air travel or plasma TVs

Fuel poverty – ‘actual’ basis

- 12 households with actual bills before & after
 - 3 probably in FP before – only 1 after
 - If no measures
 - 4 would have been in FP now
 - one vulnerable person would have been paying 25% of income on heating (June 2008 energy prices)
- Problem of FP definition
 - this is actual spend, not what they need to spend to keep the living room at 21°C and the other rooms at 18°C

Fuel Poverty – actual bills

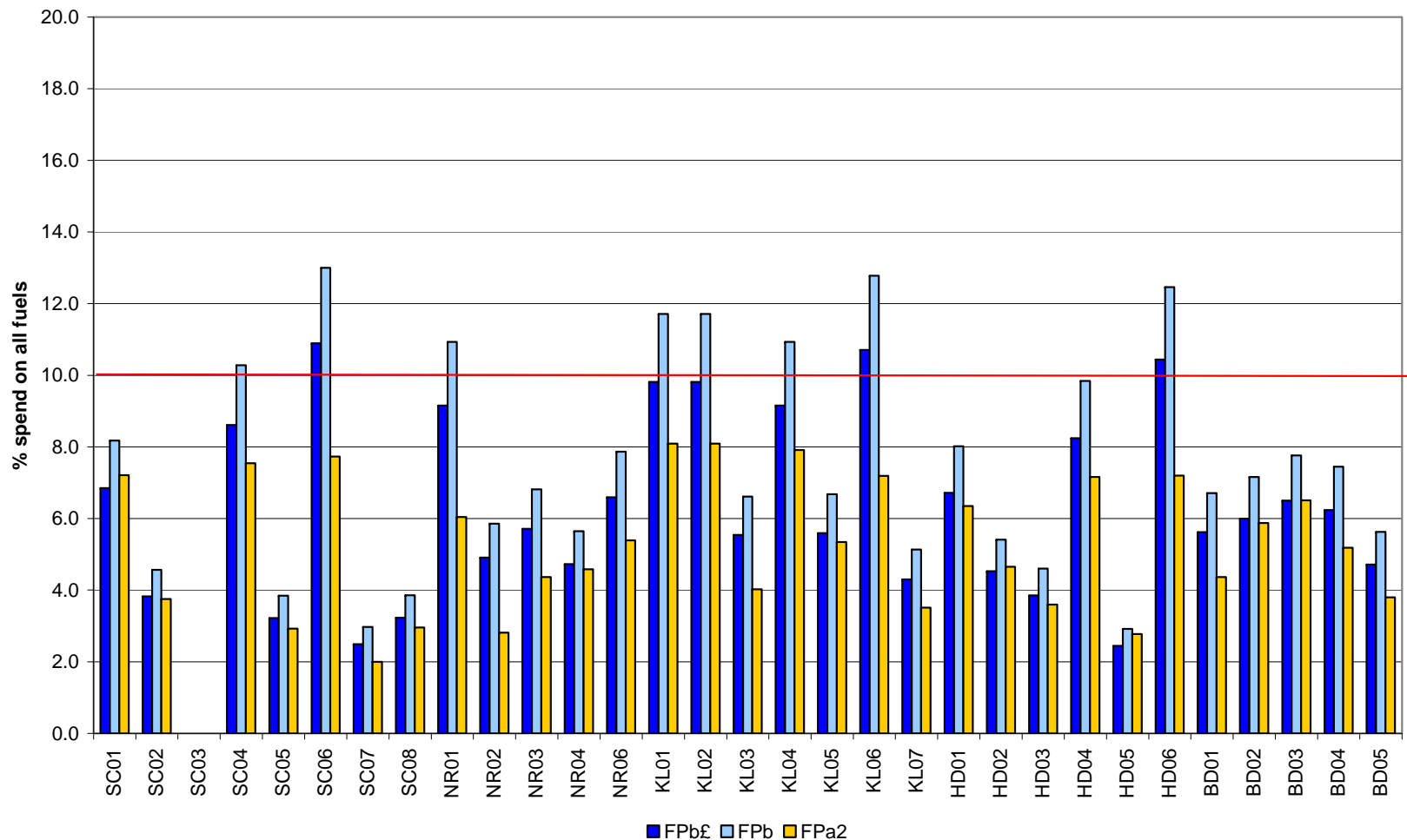


Fuel poverty – ‘modelled’ basis

- Modelled ‘before’ bills
 - 4 out of 30 spend 10%+ on heating now (June 2008 prices)
 - 3 in hard to treat homes,
 - other keeps his house warm - technically may not be in FP
 - 8 would have been in FP before measures
 - If no measures now – 9 would have been in FP
- Problem of FP definition
 - Modelling assumes they **are** heating their homes to the ‘correct’ level

Fuel poverty – modelled....

- Blue is before measures – light blue is current prices for previous fuel use



Carbon reduction vs. fuel poverty

- Carbon saved by these 31 households
47.9 tCO₂/yr
 - Equal to or better than Carbon Emissions Reduction Target (CERT) assumptions
- Suggests if cost to LA similar to CERT,
 - value of programmes for 'fuel poor' the same or better than to 'fuel rich'
- No change to what they do with their lifestyles – apart from feel more comfortable

Case studies

- Five candidates selected (duty/interest)
- Four vulnerable households, other 'young' pensioners
- Average Act On CO₂ footprint **8.9** tCO₂/yr
- Calculated FP (% income) either actual based on usage/bills or modelled

Case study – Ms C

- Footprint 11.8 tCO₂/yr
- FP before 10.0, after 6.7 %income
- Family, traditional timber house, special needs son + infant
- Huge difference to warmth
- Children's health improved
- Not been so worried about bills, less stress about new shoes
- All sleeping better
- Temps barely reaching guidelines



Case study – Mrs W

- Footprint 10.6 tCO₂/yr
- FP a(m) before 6.8 (13.0), after 8.5 (7.7) %income
- Elderly, disabled lady and her full-time carer
- Huge difference to warmth
- No risk of chill at night
- Maintain coal fire for comfort
- Always worried about bills
- Temps barely reaching guidelines



Conclusions

- Concern for vulnerable people and real issues on lifestyles
- Carbon footprint must not further marginalise people
- Concern for proxy for fuel poverty Priority Groups
 - Sefton research – focus on SAP30-
 - (support for NEA Energy Efficiency Strategy)

Research Conclusions

- No evidence that people who receive measures under a fuel poverty programme are likely to spend on high-carbon emissions products and services.
 - 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.
 - robust study using kWh measurements before and after recommended
- Further exploration of the value of programmes for 'hard to treat' homes – off the gas network and/or with walls that cannot be cavity wall insulated – needed
 - carbon savings and social benefits for vulnerable people in these homes suggest greater carbon savings than hitherto calculated



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