

# Fuel Poverty Carbon Footprint

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Pett Projects

Sustainable energy and buildings research



eaga  
partnership  
charitable  
trust

# Purpose of project

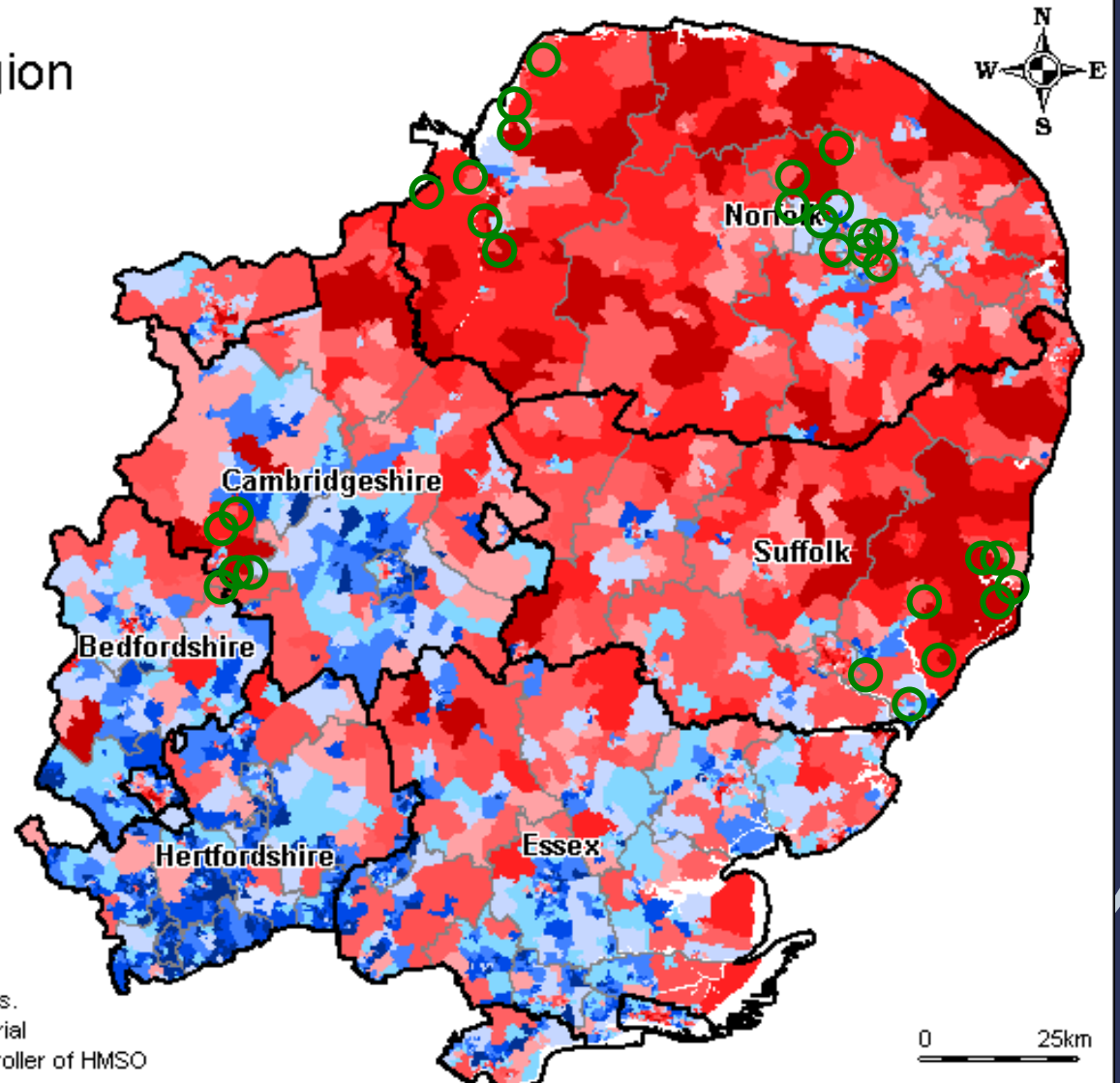
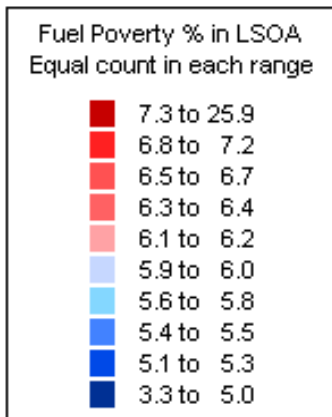
- Issues of concern
  - National Indicators 186 (carbon emissions) vs 187 (fuel poverty)
  - research about direct and indirect rebound effects
    - use of any cost savings from measures
    - whether they increased their carbon footprint
- Purpose
  - inform debate on whether fuel poverty programmes conflict with carbon emissions reduction programmes
- Objectives
  - collect data to establish the carbon footprint using the Government's Act On CO<sub>2</sub> 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

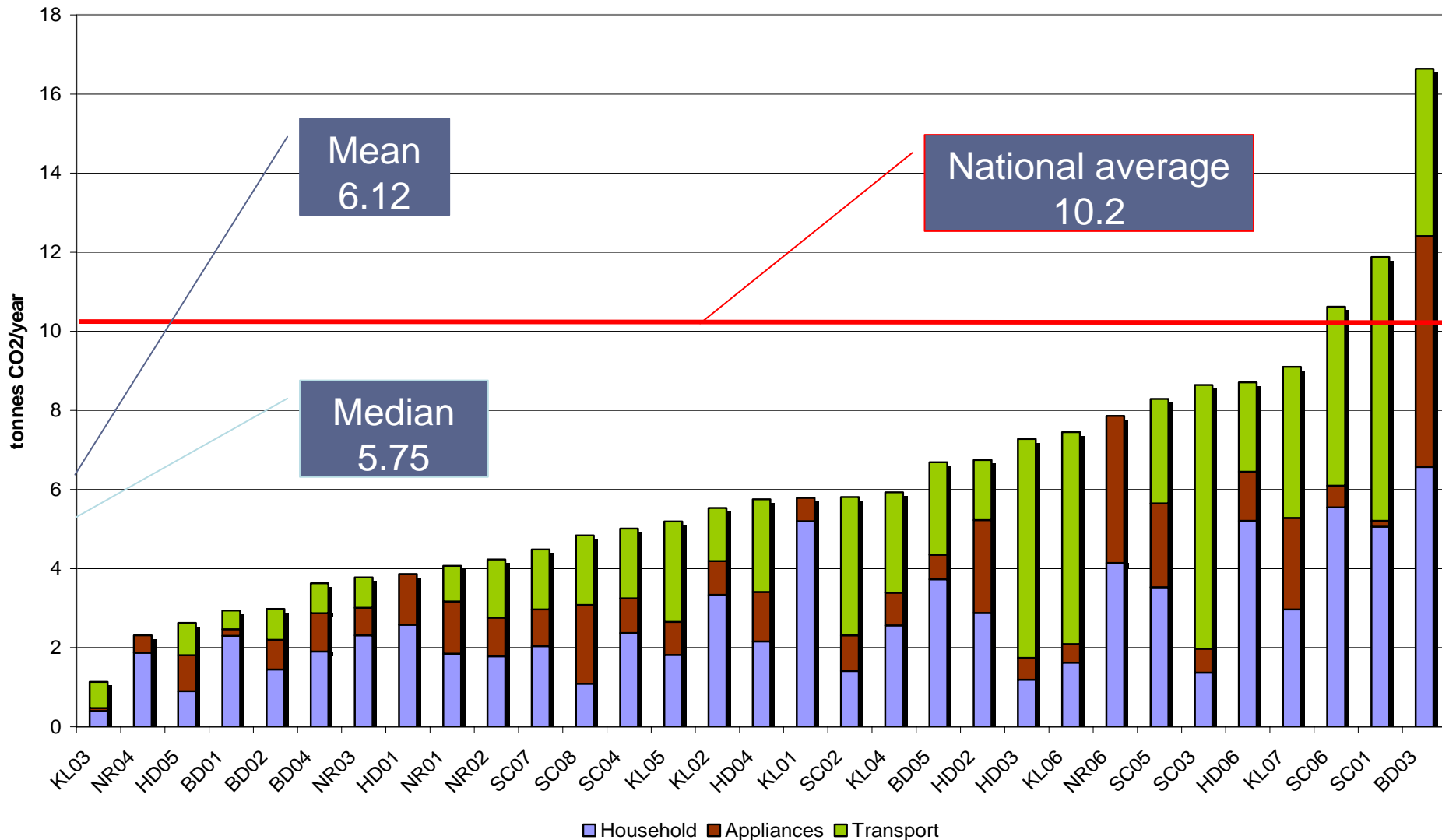
# Dwellings

(n=31)	2 bedroom	3 bedroom	4 bedroom
Maisonette	1		
Mid-terrace House		4	1
End-terrace House	2		
Semi-detached house		7	1
Semi-detached bungalow	2		
Detached house		2	1
Detached bungalow	6	4	

# Measures

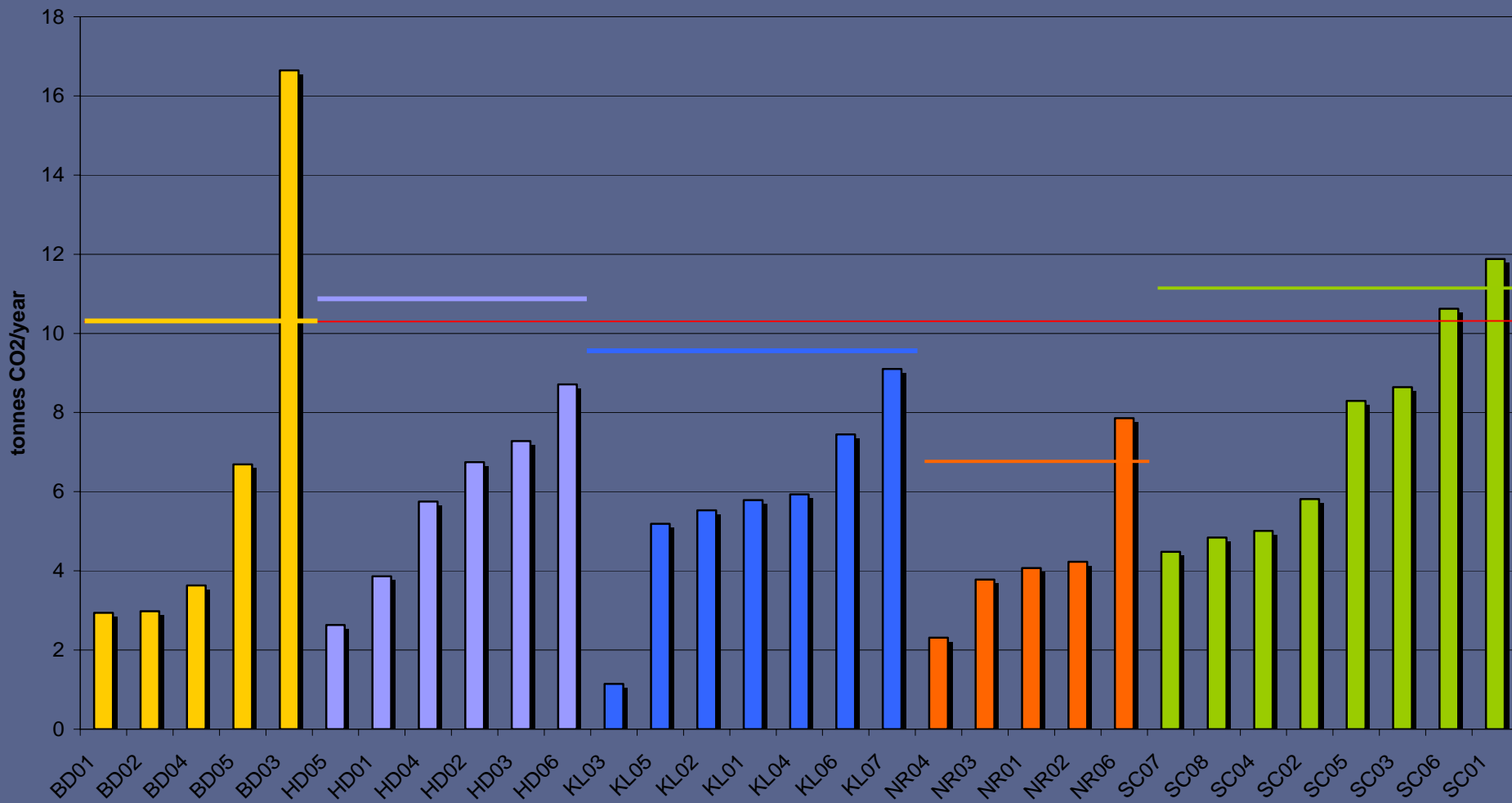
Before	Number	After	Number
LI, CWI, gas ch	6	Plus LTU & Gas CB	3
		Gas CB	3
LI, CWI, electric	4	Gas CB + ch	2
		Oil CB + ch	2
LI, CWI, open or solid fuel fire	2	Plus Gas CB & open fire	1
		Plus oil CB and open fire	1
LI, CWI, oil boiler	1	Oil CB	1
LI & gas fire	2	Plus CWI	1
		Plus LTU, Gas CB + ch	1
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 tCO<sub>2</sub>/yr
- Average after measures 2.68 tCO<sub>2</sub>/yr
- Av. reduction 1.71 tCO<sub>2</sub>/yr
- Compares well with Warm Front measured average 1.2 tCO<sub>2</sub>/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

- 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)
- 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

# Carbon reduction vs. fuel poverty

- Carbon saved by these 31 households  
47.9 tCO<sub>2</sub>/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 CO<sub>2</sub> footprint **8.9** tCO<sub>2</sub>/yr
- Calculated FP (% income) either actual based on usage/bills or modelled

# Case study – Mrs F

- Footprint 6.9  $\text{tCO}_2/\text{yr}$
- FP before 6.9, after 5.6 %income
- 80+ widow, rented mid-terrace
- easier to keep warm
- lovely to come into a warm hall on a cold day
- not been so worried about bills
- treated herself to some things
- getting out and about more

# Case study – Ms C

- Footprint 11.8 tCO<sub>2</sub>/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 tCO<sub>2</sub>/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

# Case study – Mr & Mrs M

- Footprint 8.3 tCO<sub>2</sub>/yr
- FP before 4.3, after 3.5 %income
- Retired couple under 75
- Enjoy active lifestyle, with holidays and trips to the nearby towns
- Capped bills to 2010, can't tell whether changes made a difference to bills
- House is warmer
  - Mr M finds it too warm before the thermostat goes off
  - Mrs M finds it too cold before the thermostat switches back on again
- Upstairs it is warm enough to have only the landing radiator on

# Case study – Miss Y

- Footprint 6.7  $\text{tCO}_2/\text{yr}$
- FP a(m) before (5.2), after 5.8 (3.5)  
%income
- Single mother and infant
- Earns just too much to get any benefits
- Grows c 50% own vegetables; keen recycler; vegan lifestyle
- Oil c/h too hot upstairs and too cold downstairs
- Not so worried about fuel bills as before
  - using about two-thirds the oil
  - worried about bills generally
  - all costs increasing while on a tight budget

# 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-

Sefton (2004) *Aiming High – an evaluation of the potential contribution of Warm Front towards meeting the Government's fuel poverty target in England*. CASE, London School of Economics, London

# 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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