

Sustainable Consumption and Production – Modelling and Applications

Dr. John Barrett

Stockholm Environment Institute

The Stockholm Environment Institute

SEI is an independent, international research institute specialising in sustainable development and environment issues



SEI Stockholm

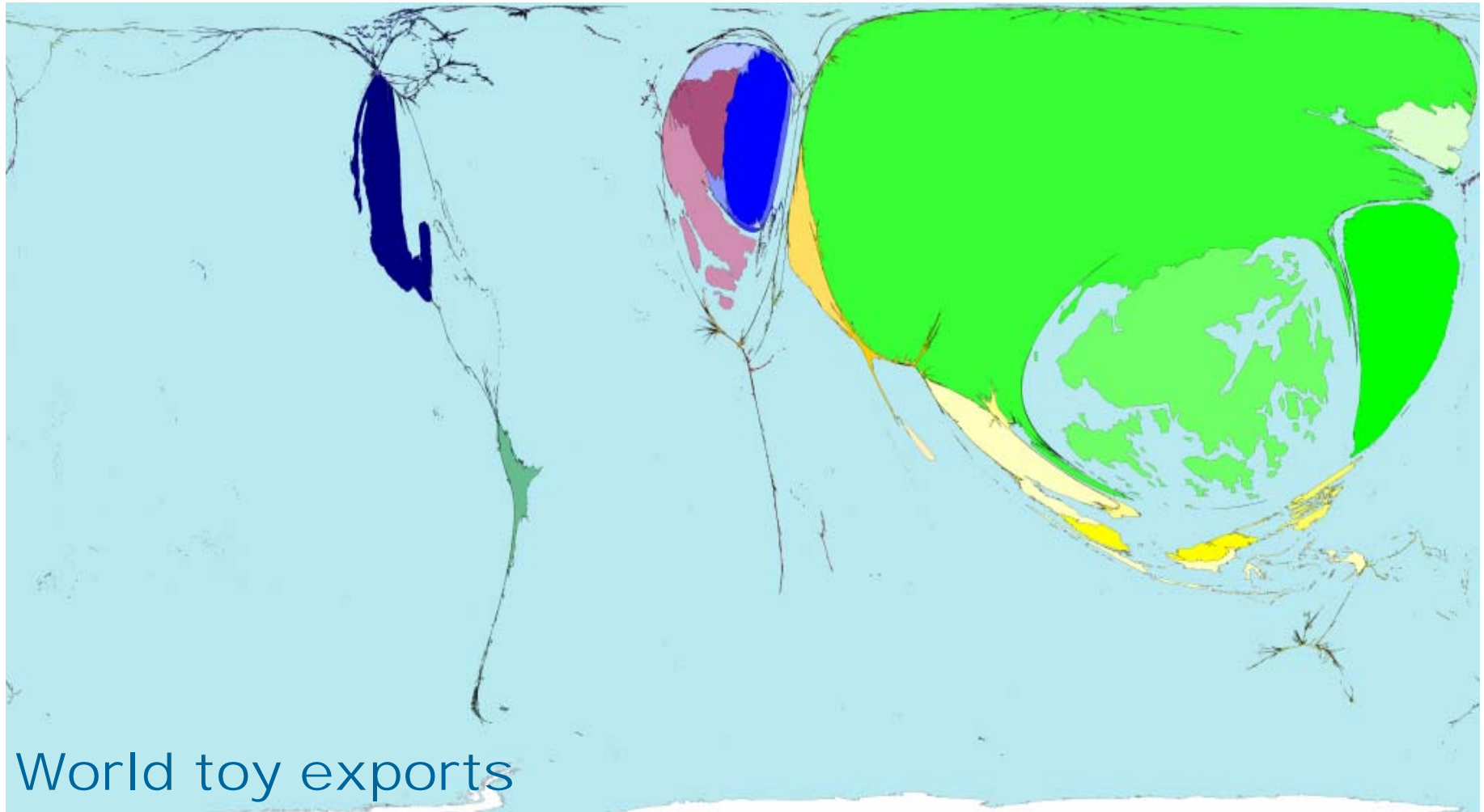
SEI US

SEI Tallinn

SEI York

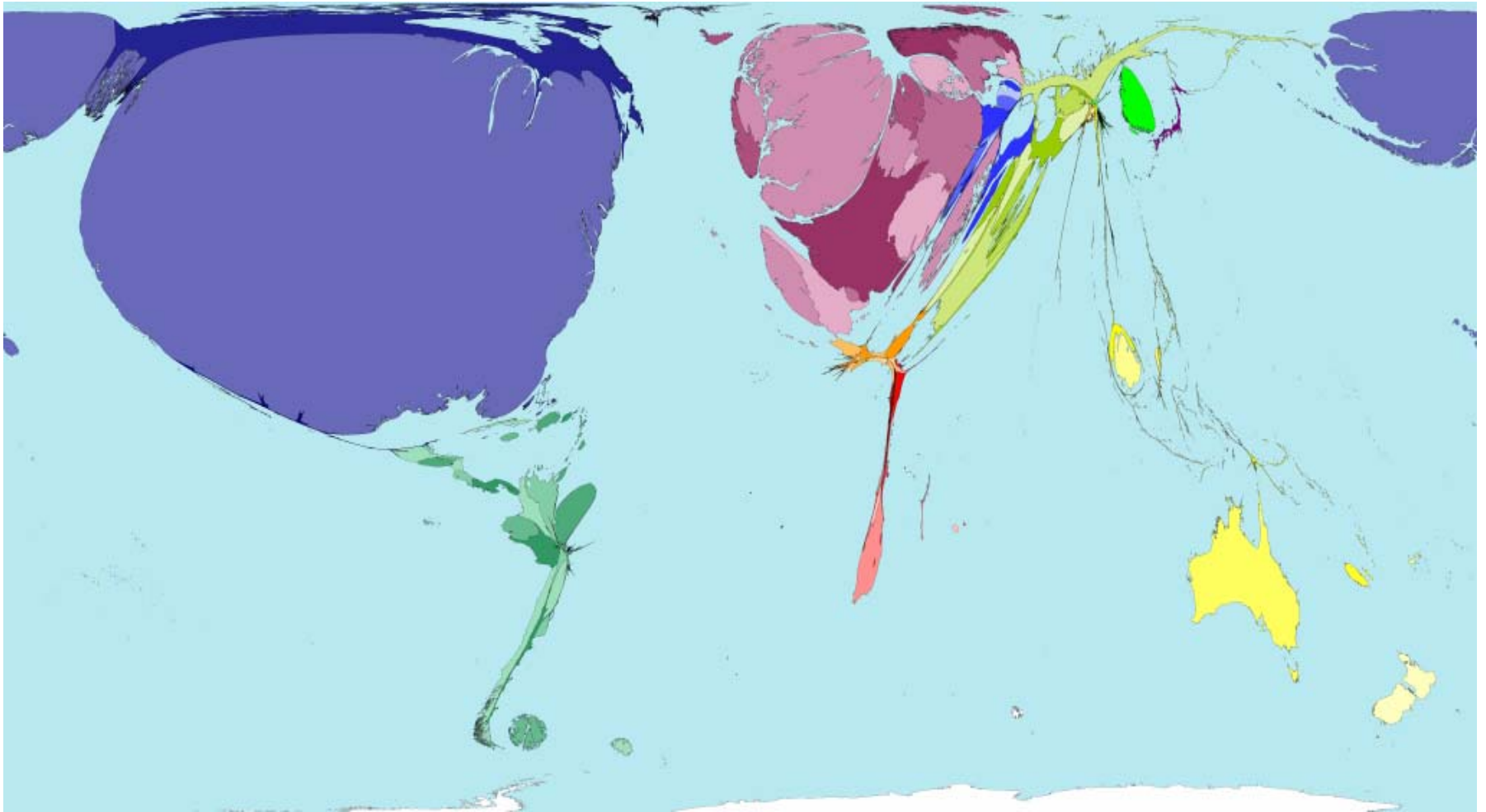
SEI Asia

....and where did it come from?

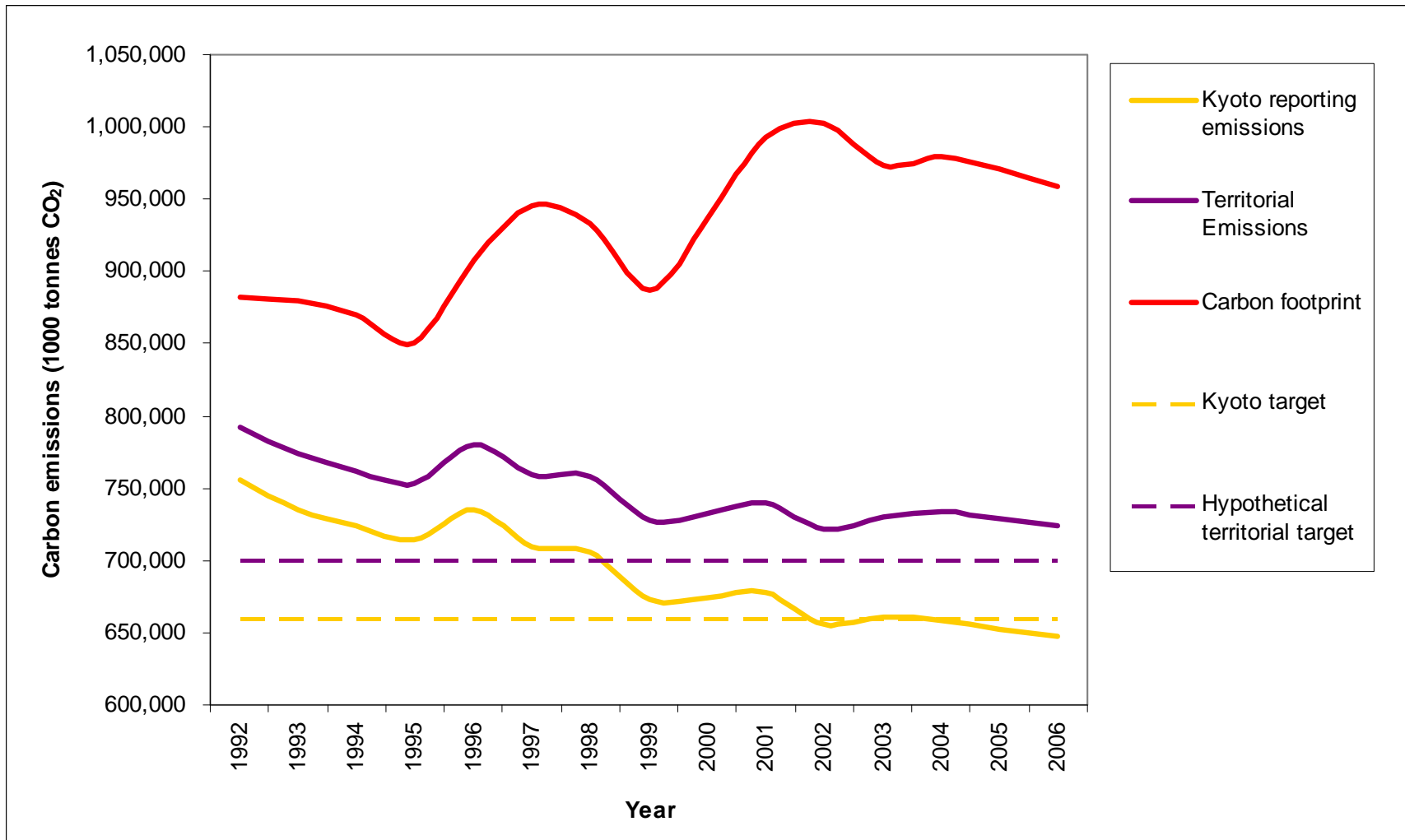


World toy exports

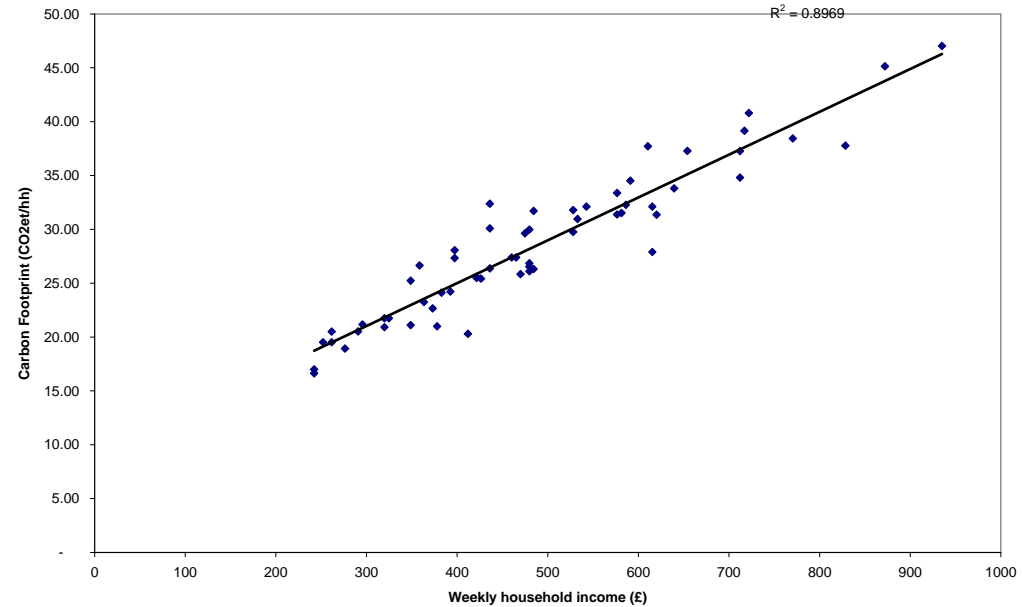
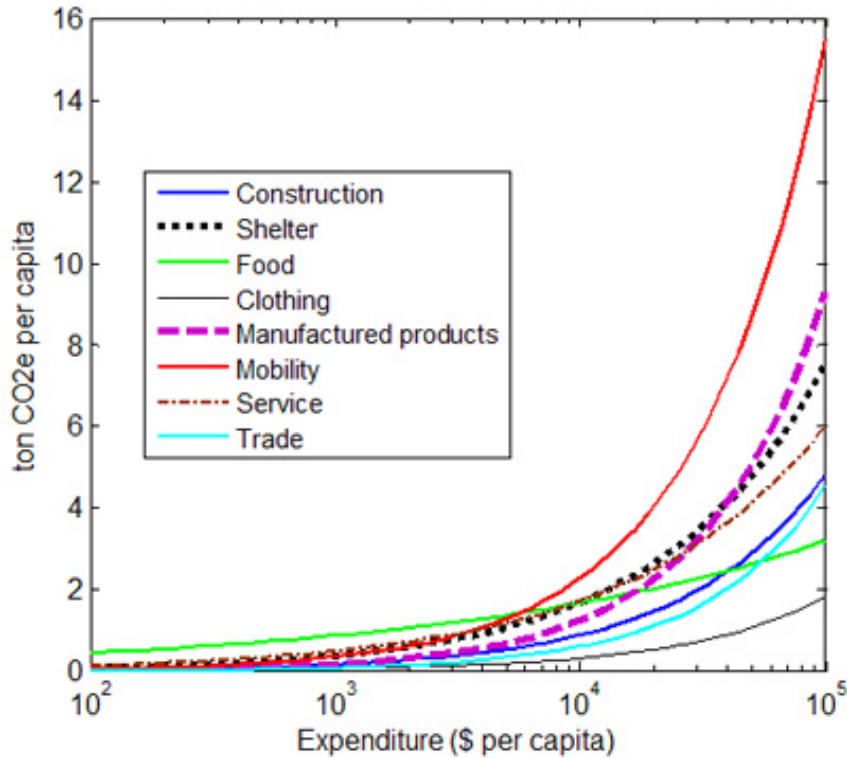
World toy imports



Development of UK CO2 emissions from 1992 to 2004

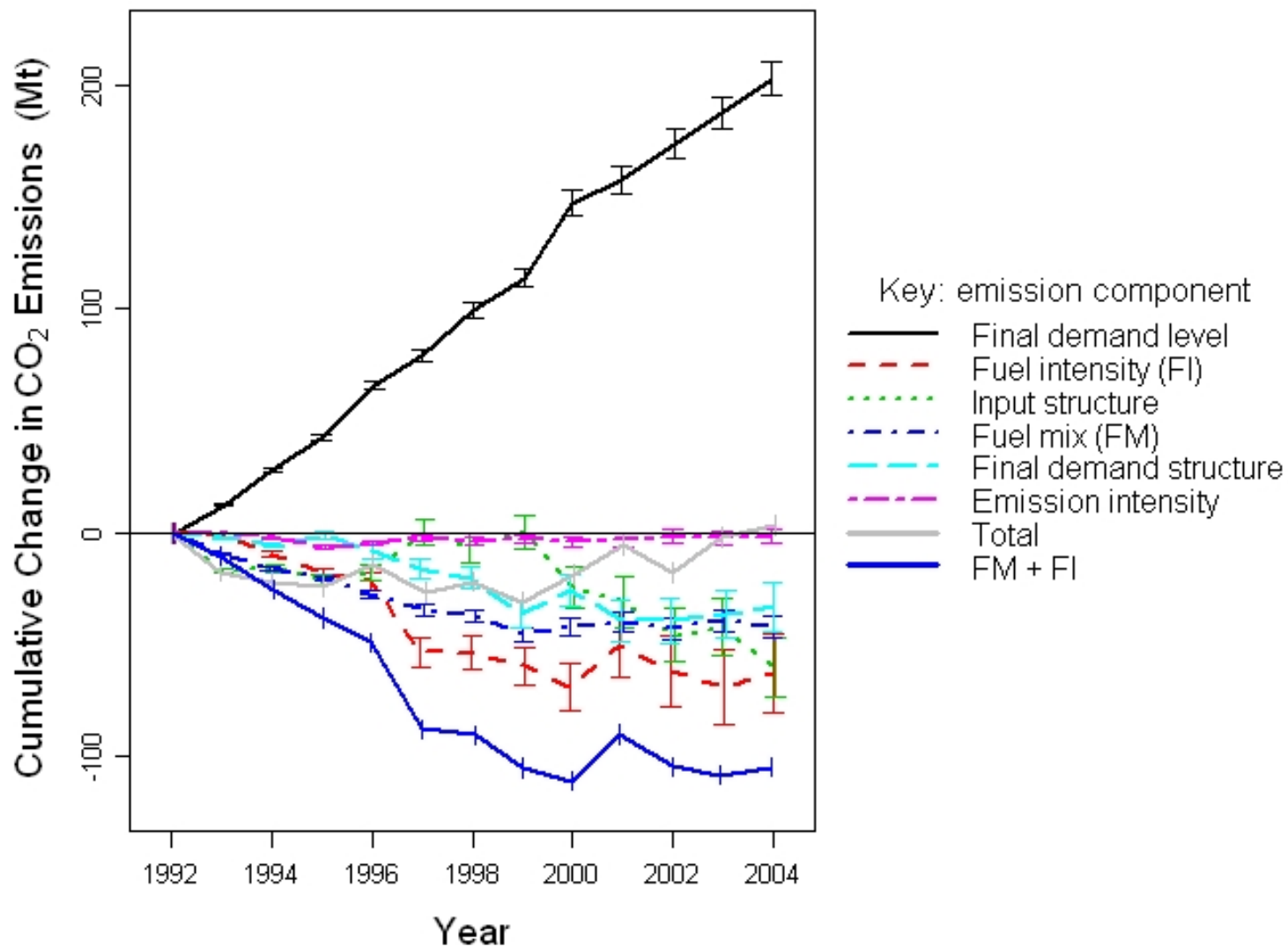


Relationship between Economic Growth and GHG Emissions

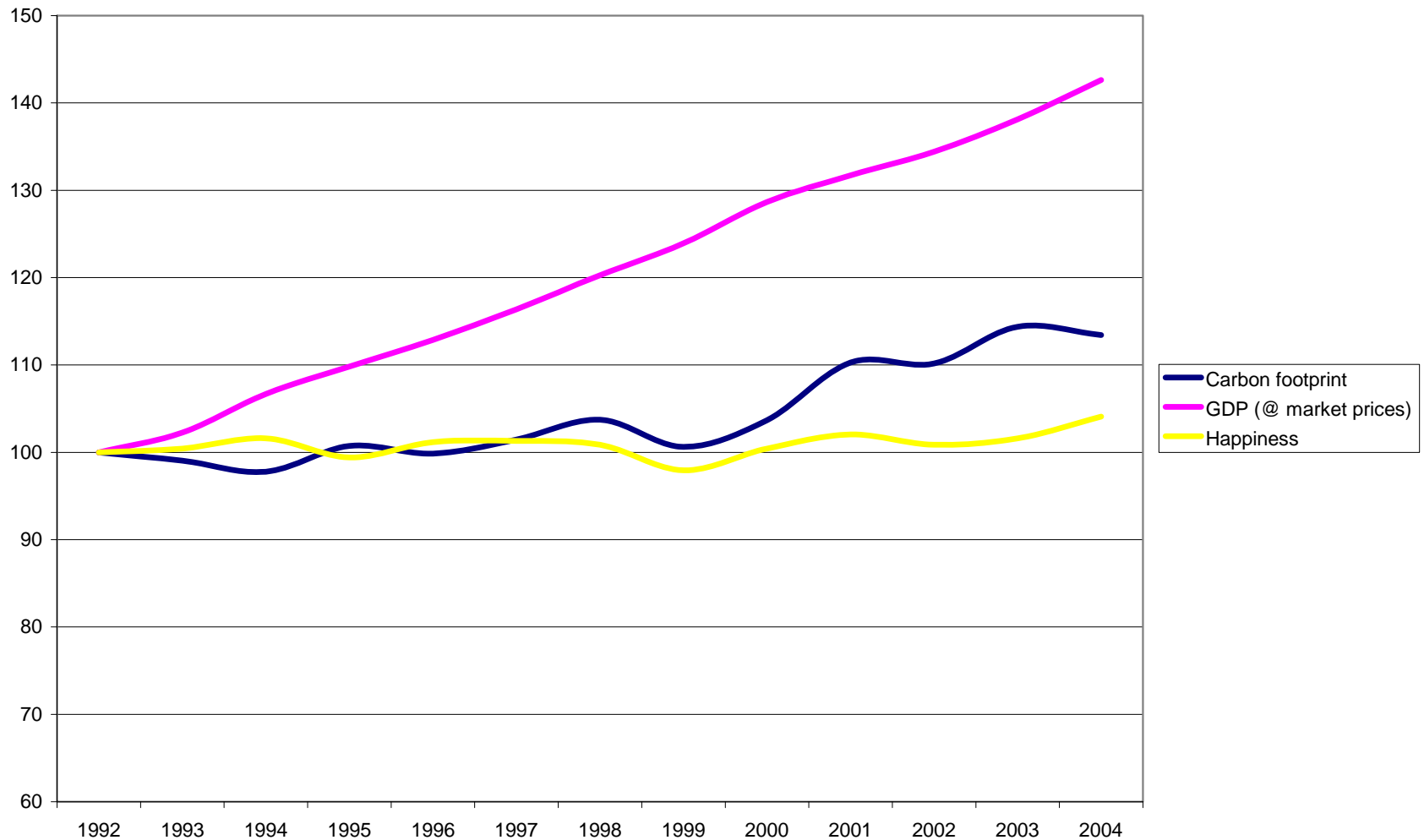


Source: Hertwich and Peters, 2009

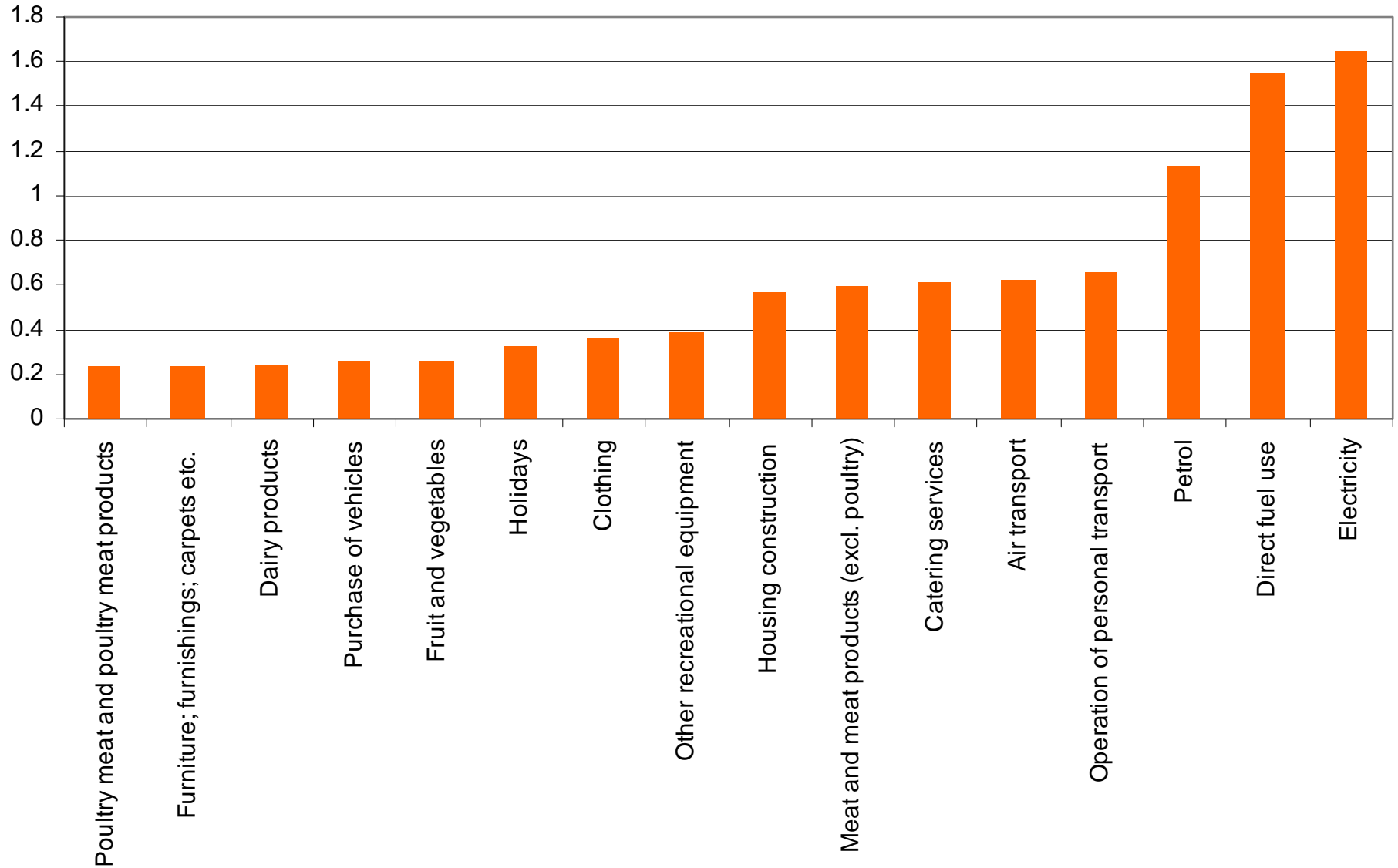
Decomposition Analysis



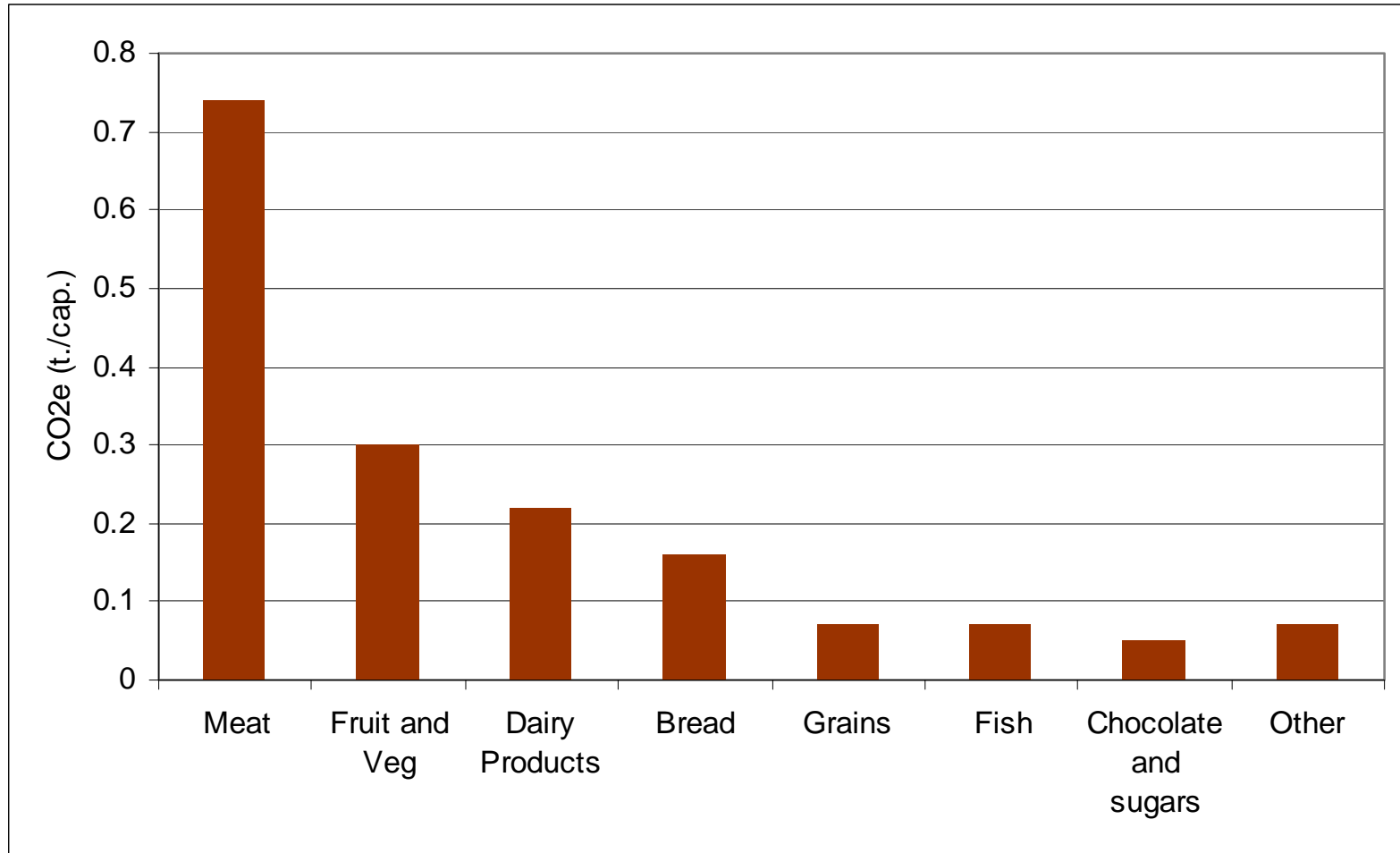
Carbon Footprints, Money and Happiness



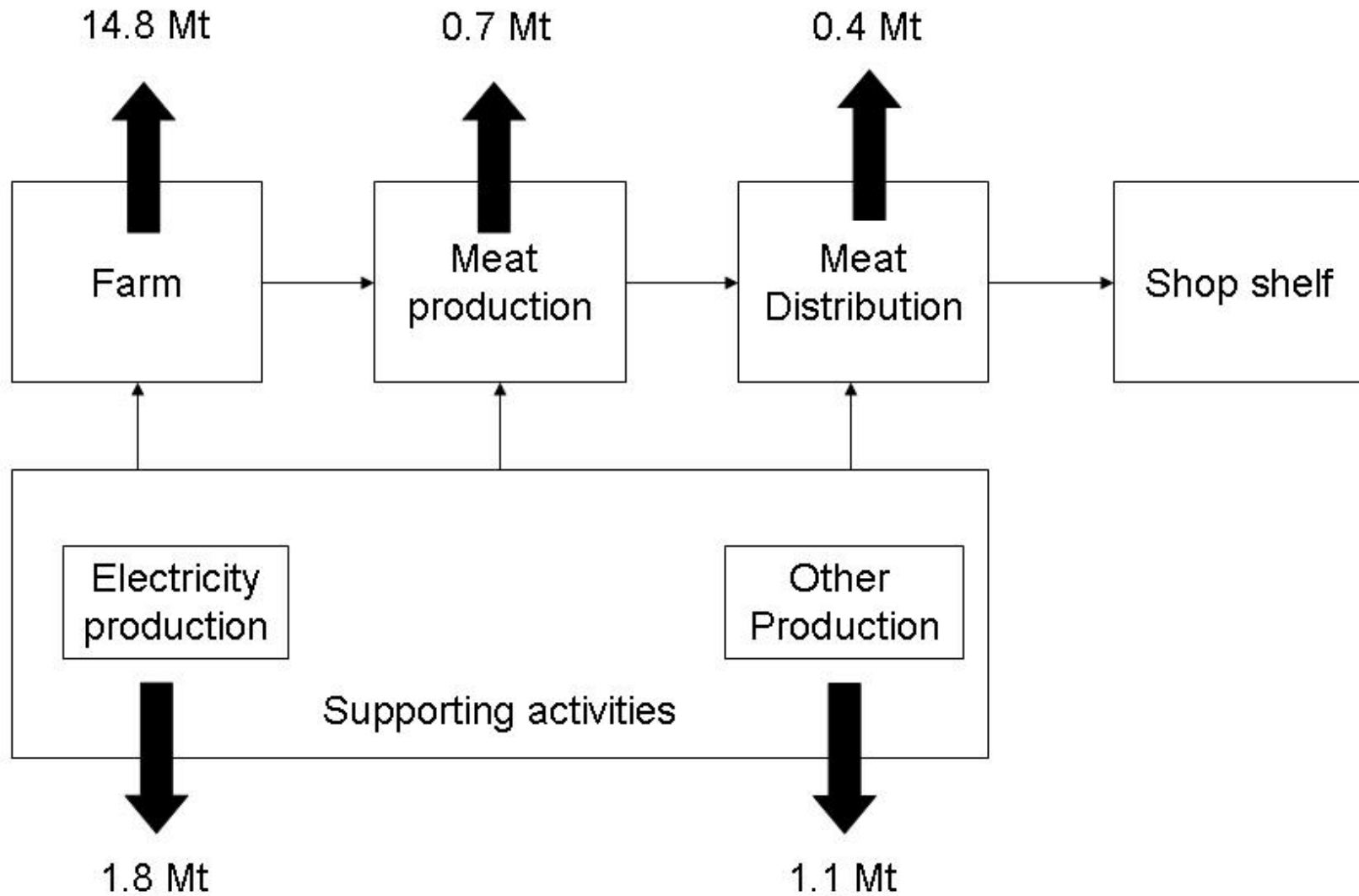
National Applications - Household Product Groups



National Applications - Household Product Groups



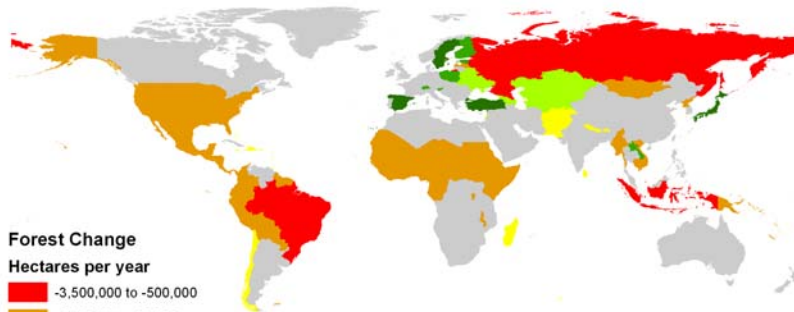
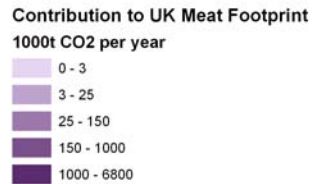
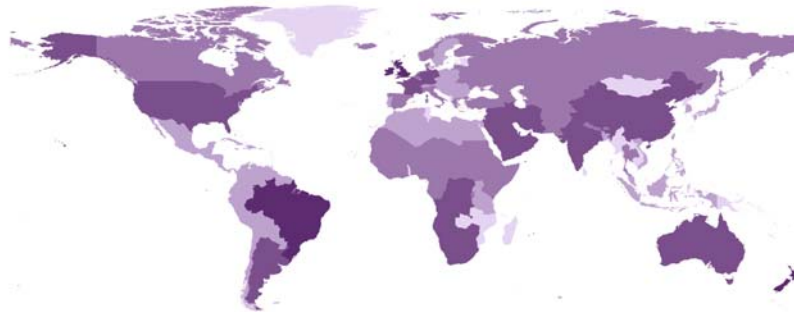
Meat Supply Chain



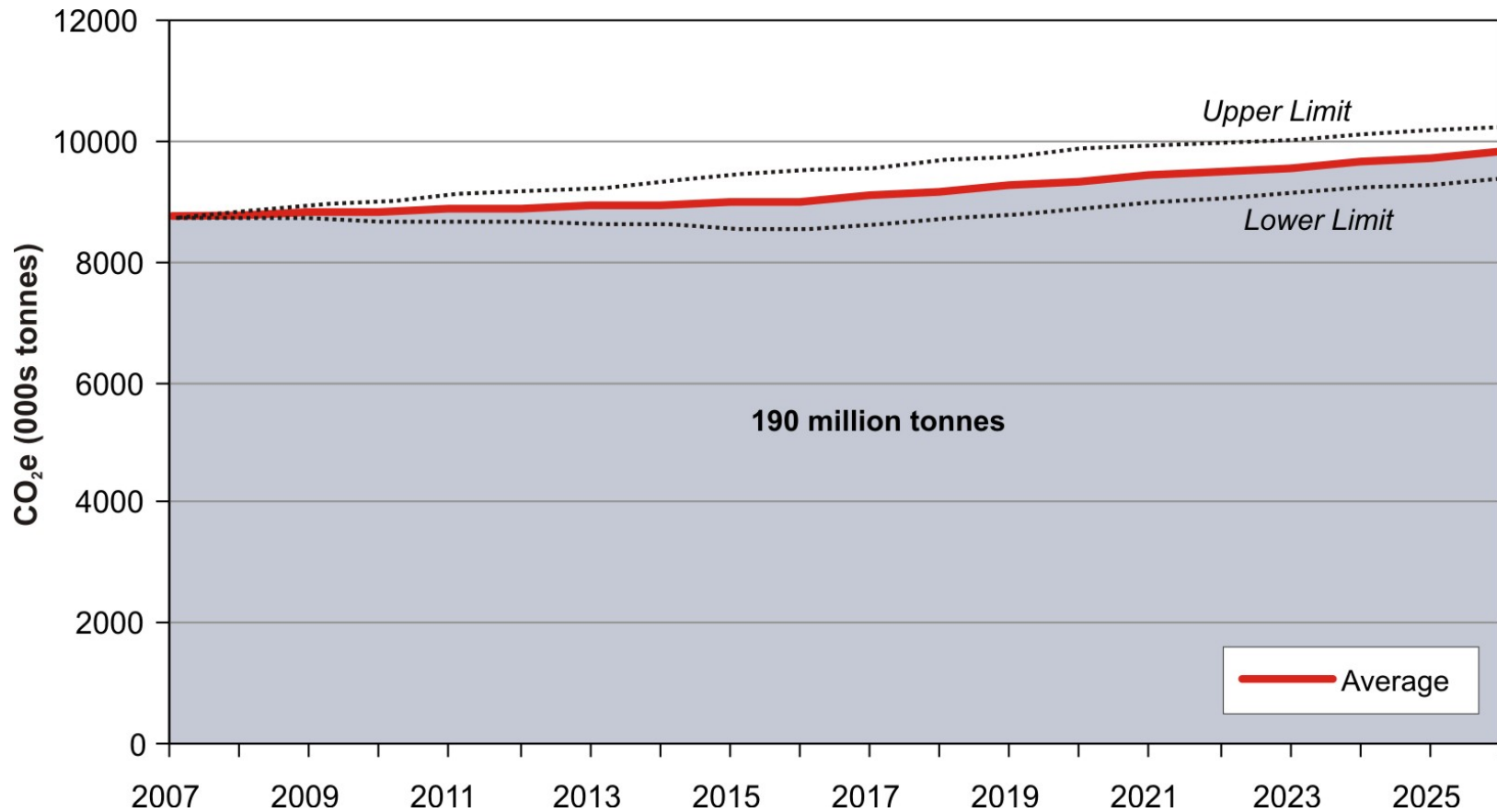
The Top Five

Pollutant	Amount (in Mt CO2e)	Process Description
CH4	2.62	Methane emissions from ruminant farming
N2O	0.73	Nitrous oxide emissions from fertiliser application and manure management on farms
CO2	0.55	Direct carbon dioxide emissions in meat manufacturing associated with ruminant meat production
CO2	0.38	Carbon dioxide emissions from production of electricity used in meat manufacturing
CO2	0.18	Carbon dioxide emissions from manufacturing of other meat products used in the production of ruminant meat

Meat and Deforestation

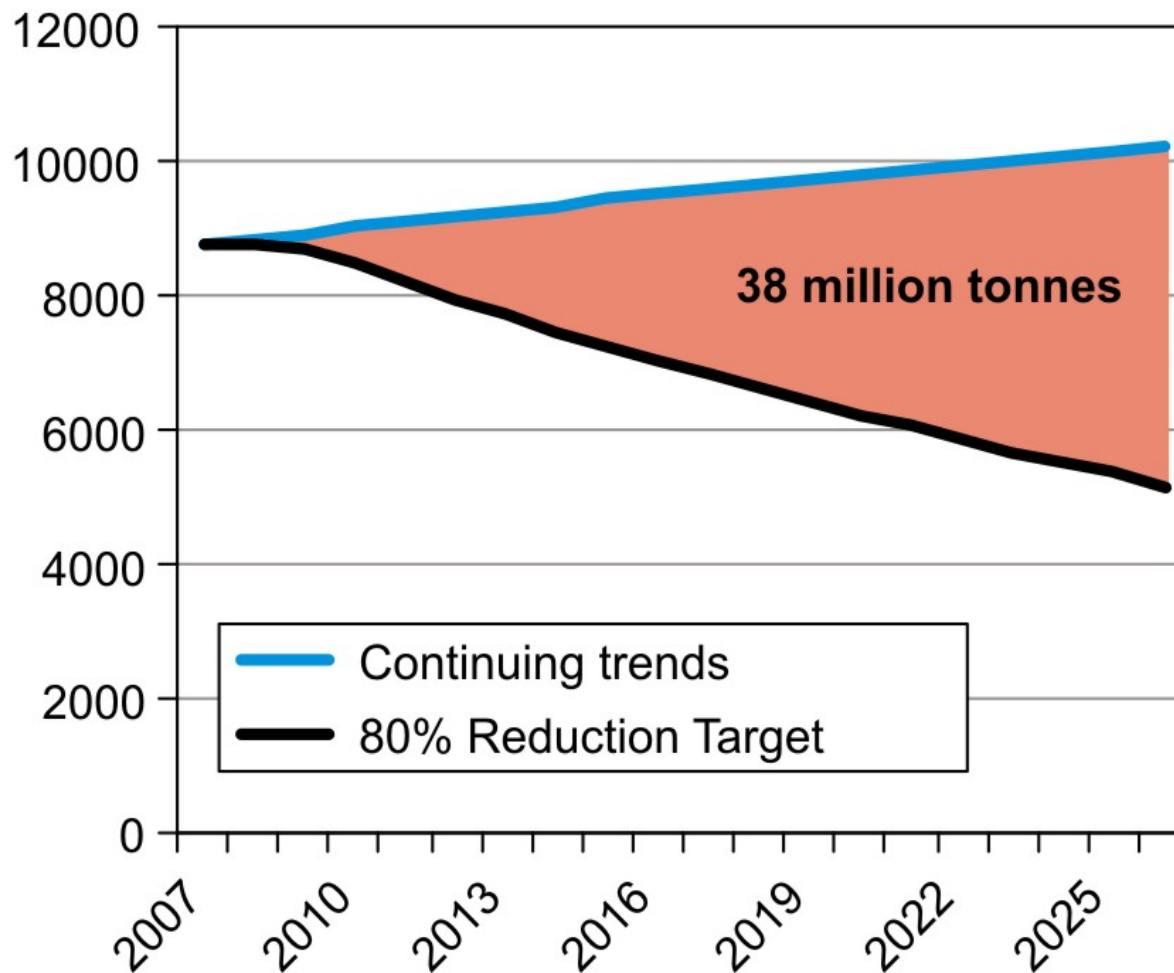


The Future



The Target

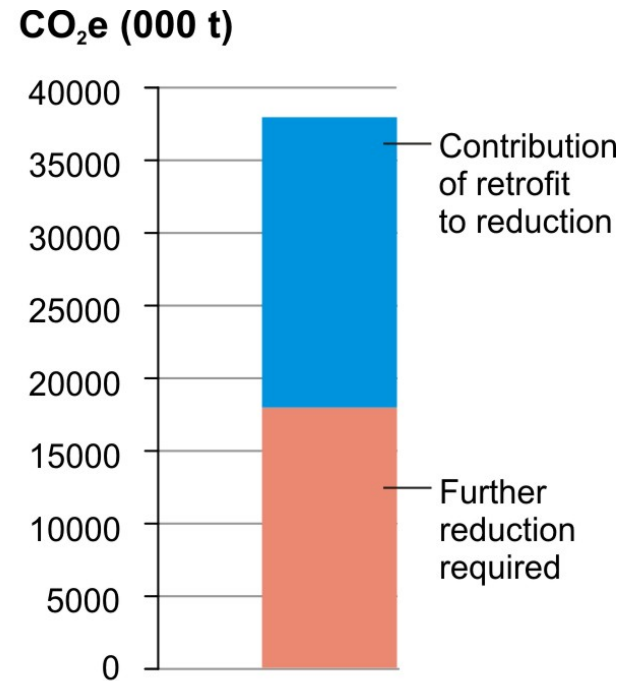
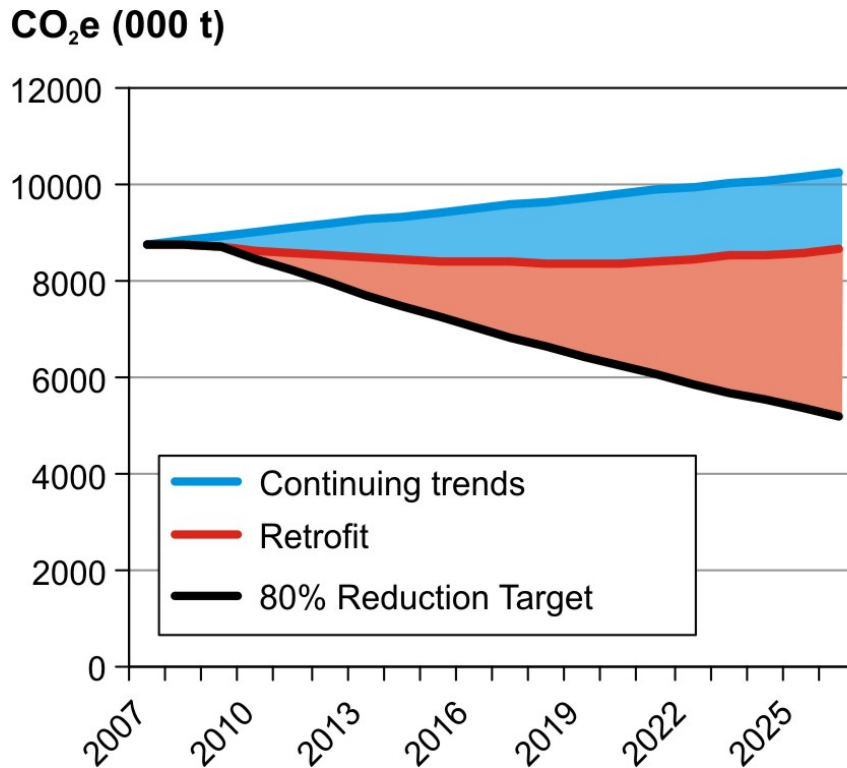
CO₂e (000 t)



Options

- Retrofit existing housing stock
- New Homes
- Behavioural Change
- Low / Zero Carbon Technologies
- Urban Renewal

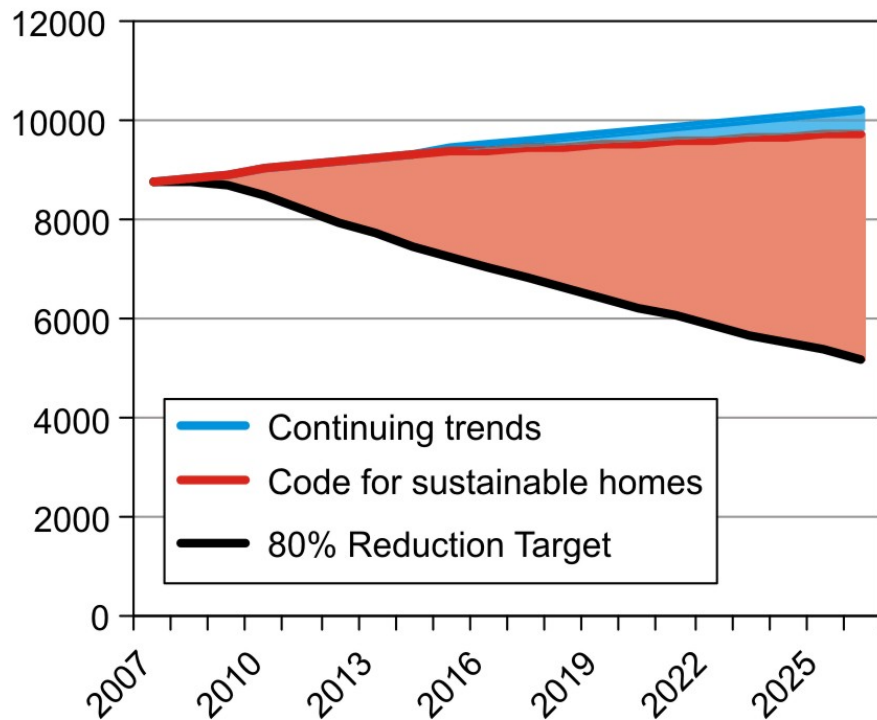
Retrofit



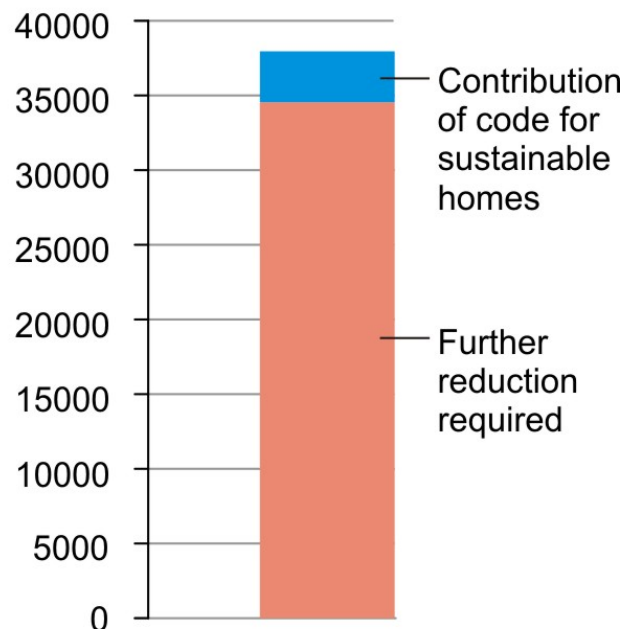
58% of Required Reduction

New Homes

CO₂e (000 t)



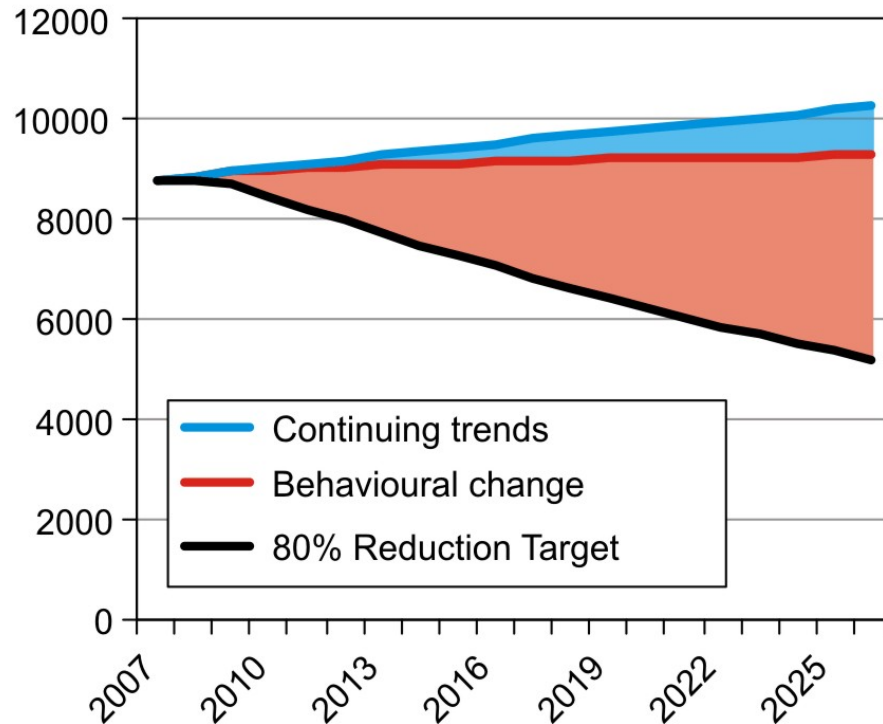
CO₂e (000 t)



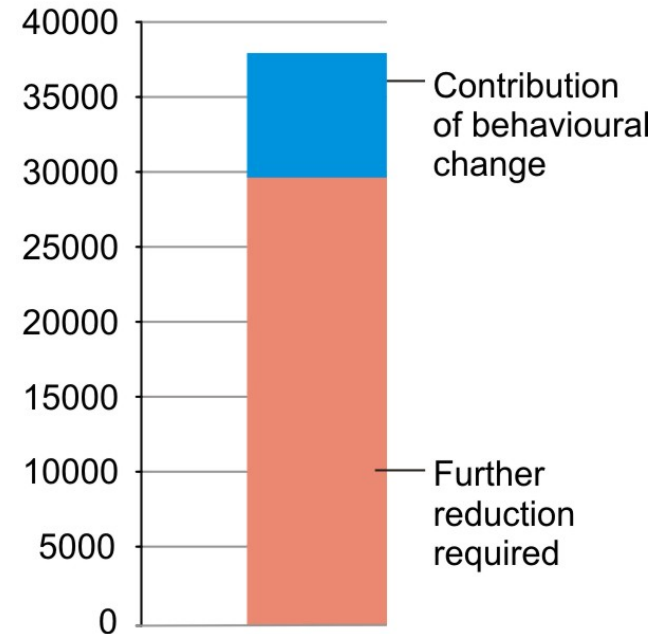
9% of Required Reduction

Behavioural Change

CO₂e (000 t)



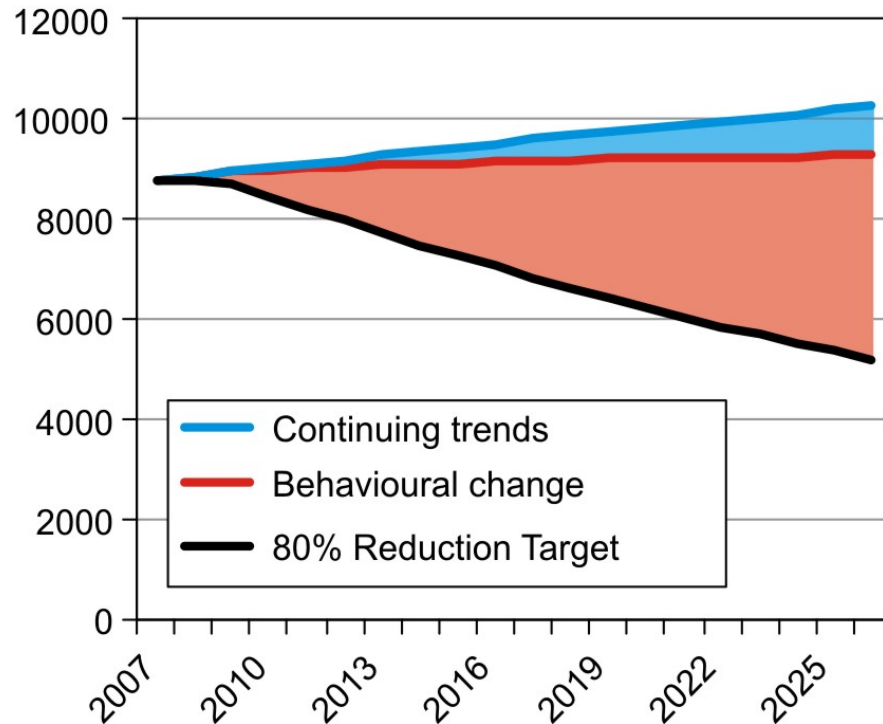
CO₂e (000 t)



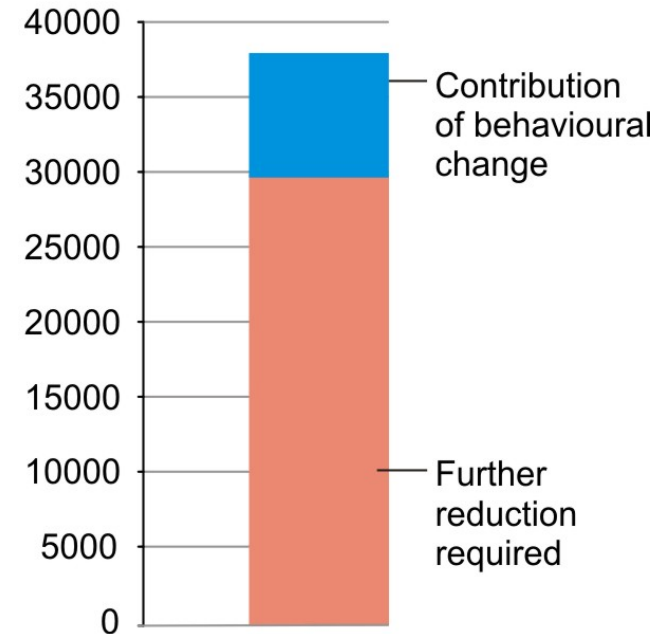
22% of Required Reduction

Low / Zero Carbon Technologies

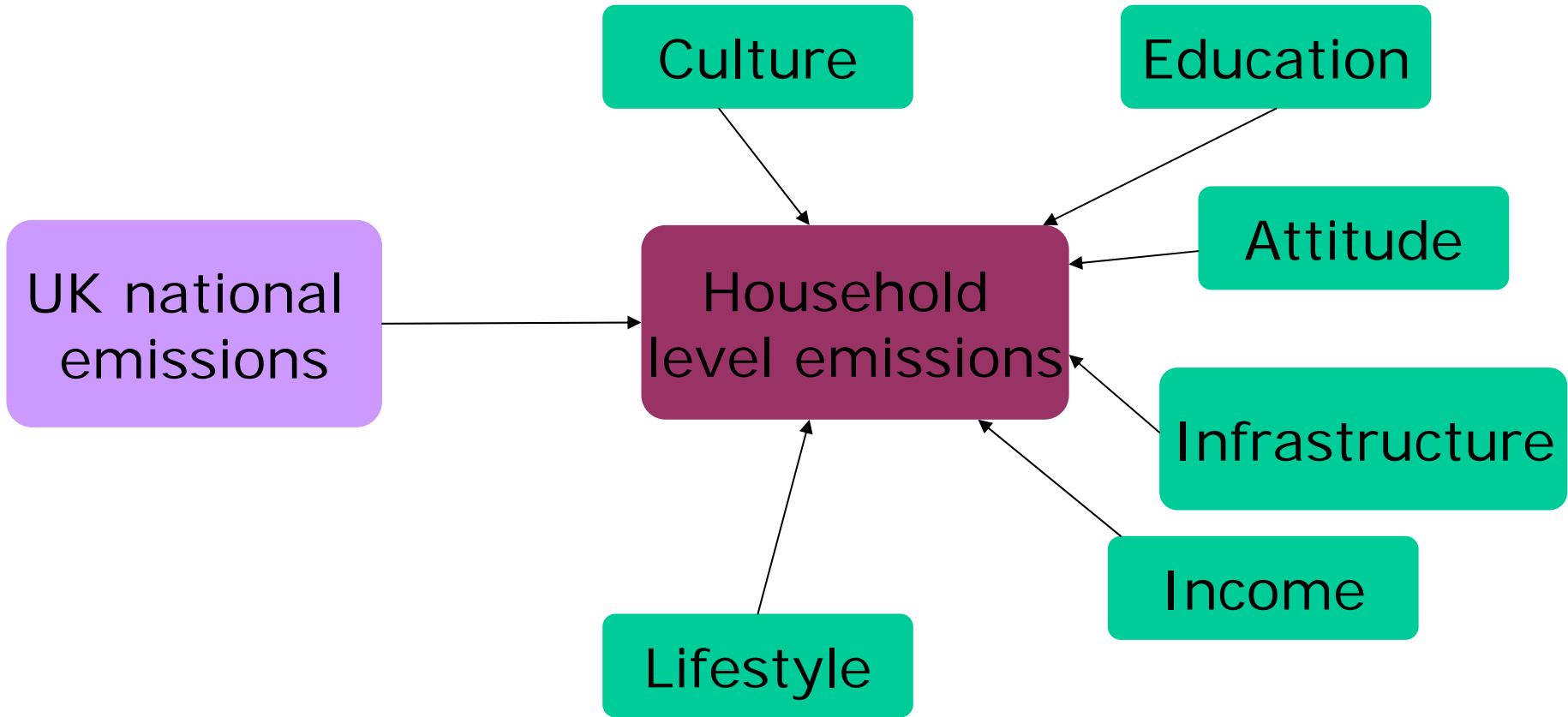
CO₂e (000 t)



CO₂e (000 t)



22% of Required Reduction



61
Types

Group	Group Description	% Households	Type	Type Description	% Households
A	Symbols of Success	9.62	A01	Global Connections	0.72
			A02	Cultural Leadership	0.92
			A03	Corporate Chieftains	1.12
			A04	Golden Empty Nesters	1.33
			A05	Provincial Privilege	1.66
			A06	High Technologists	1.82
			A07	Semi-Rural Seclusion	2.04
B	Happy Families	10.76	B08	Just Moving In	0.91
			B09	Fledgling Nurseries	1.18
			B10	Upscale New Owners	1.35
			B11	Families Making Good	2.32
			B12	Middle Rung Families	2.86
			B13	Burdened Optimists	1.96
			B14	In Military Quarters	0.17
C	Suburban Comfort	15.10	C15	Close to Retirement	2.81
			C16	Conservative Values	2.84
			C17	Small Time Business	2.93
			C18	Sprawling Subtopia	3.08
			C19	Original Suburbs	2.41
			C20	Asian Enterprise	1.02
D	Ties of Community	16.04	D21	Respectable Rows	2.65
			D22	Affluent Blue Collar	3.12
			D23	Industrial Grit	3.82
			D24	Coronation Street	2.81
			D25	Town Centre Refuge	1.13
			D26	South Asian Industry	0.88
			D27	Settled Minorities	1.62
E	Urban Intelligence	7.19	E28	Counter Cultural Mix	1.36
			E29	City Adventurers	1.27
			E30	New Urban Colonists	1.36
			E31	Caring Professionals	1.08
			E32	Dinky Developments	1.10
			E33	Town Gown Transition	0.76
			E34	University Challenge	0.26
F	Welfare Borderline	6.43	F35	Bedsit Beneficiaries	0.71
			F36	Metro Multiculture	1.67
			F37	Upper Floor Families	1.72
			F38	Tower Block Living	0.49
			F39	Dignified Dependency	1.34
			F40	Sharing a Staircase	0.50

What products do they buy?

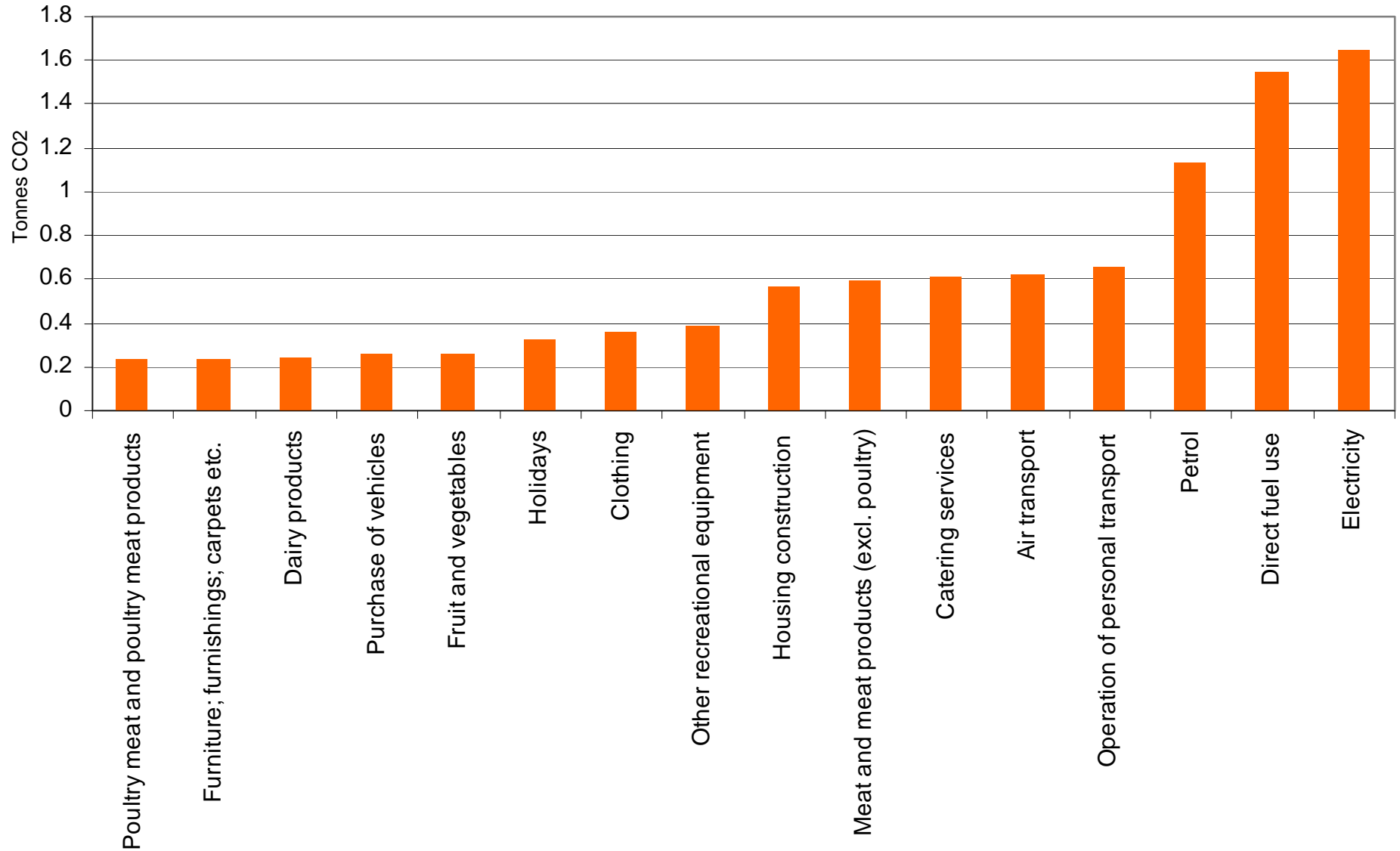


52 Products

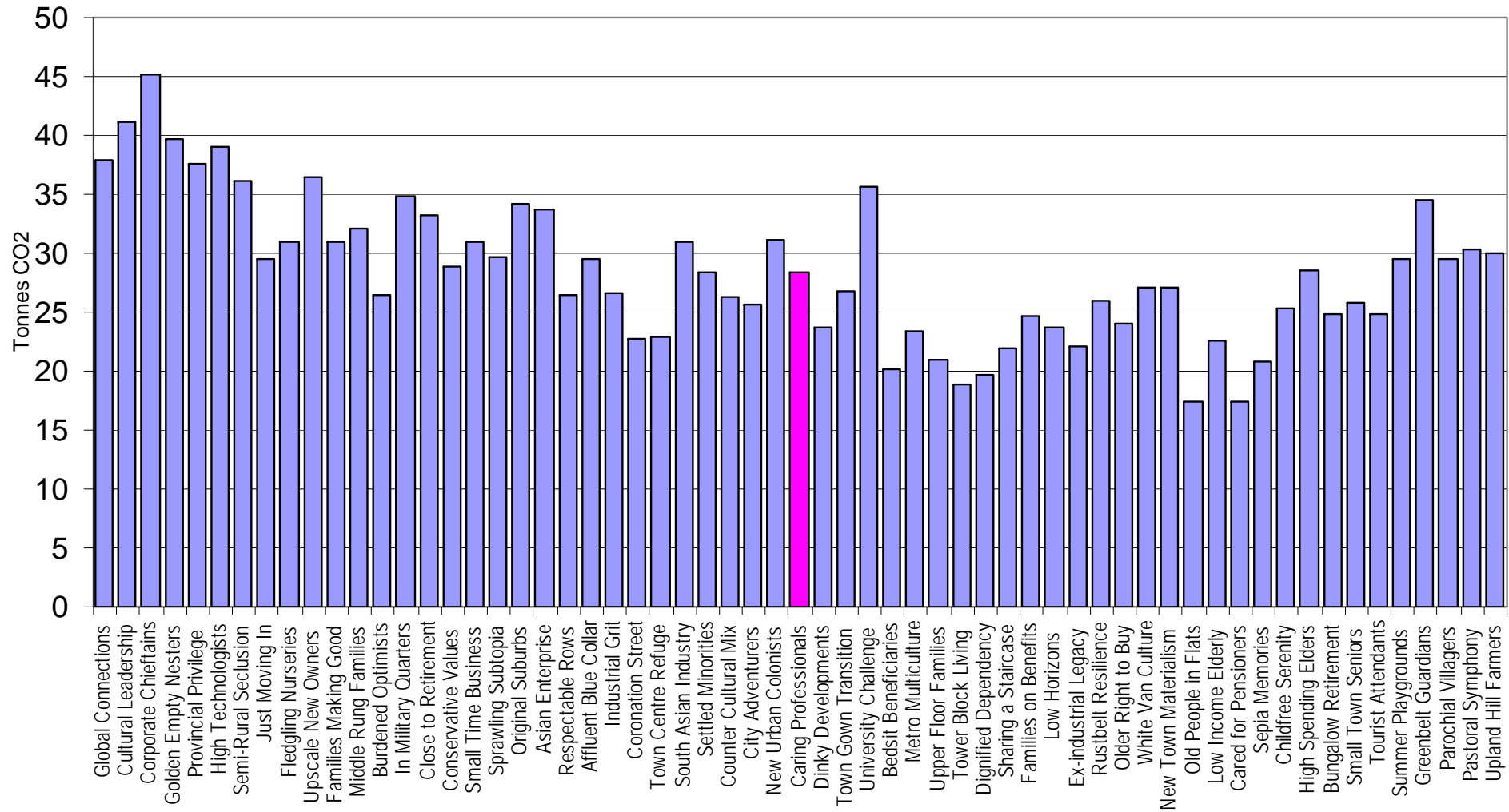
COICOP Code	Description	Caring Professionals spend (£/yr)
1.1	Food	859.06
1.2	Non-alcoholic beverages	95.93
2.1	Alcoholic beverages	42.71
2.2	Tobacco	172.04
3.1	Clothing	355.91
3.2	Footwear	42.72
4.1	Actual rentals for housing	1042.53
4.2	Imputed rentals for housing	2646.81
4.3	Maintenance and repair of the dwelling	184.45
4.4	Water supply & miscellaneous dwelling services	123.09
4.5	Electricity; gas & other fuels	332.17
5.1	Furniture	160.61
5.2	Household textiles	53.16
5.3	Household appliances	78.85
5.4	Glassware	29.07
5.5	Tools and equipment for house & garden	48.54
5.6	Goods & services for household maintenance	98.35
6.1	Medical products	63.18
6.2	Out-patient services	45.91
6.3	Hospital services	56.62
7.1	Purchase of vehicles	217.00
7.2	Operation of personal transport equipment	503.65
7.3	Transport services	405.89

Expenditure breakdown

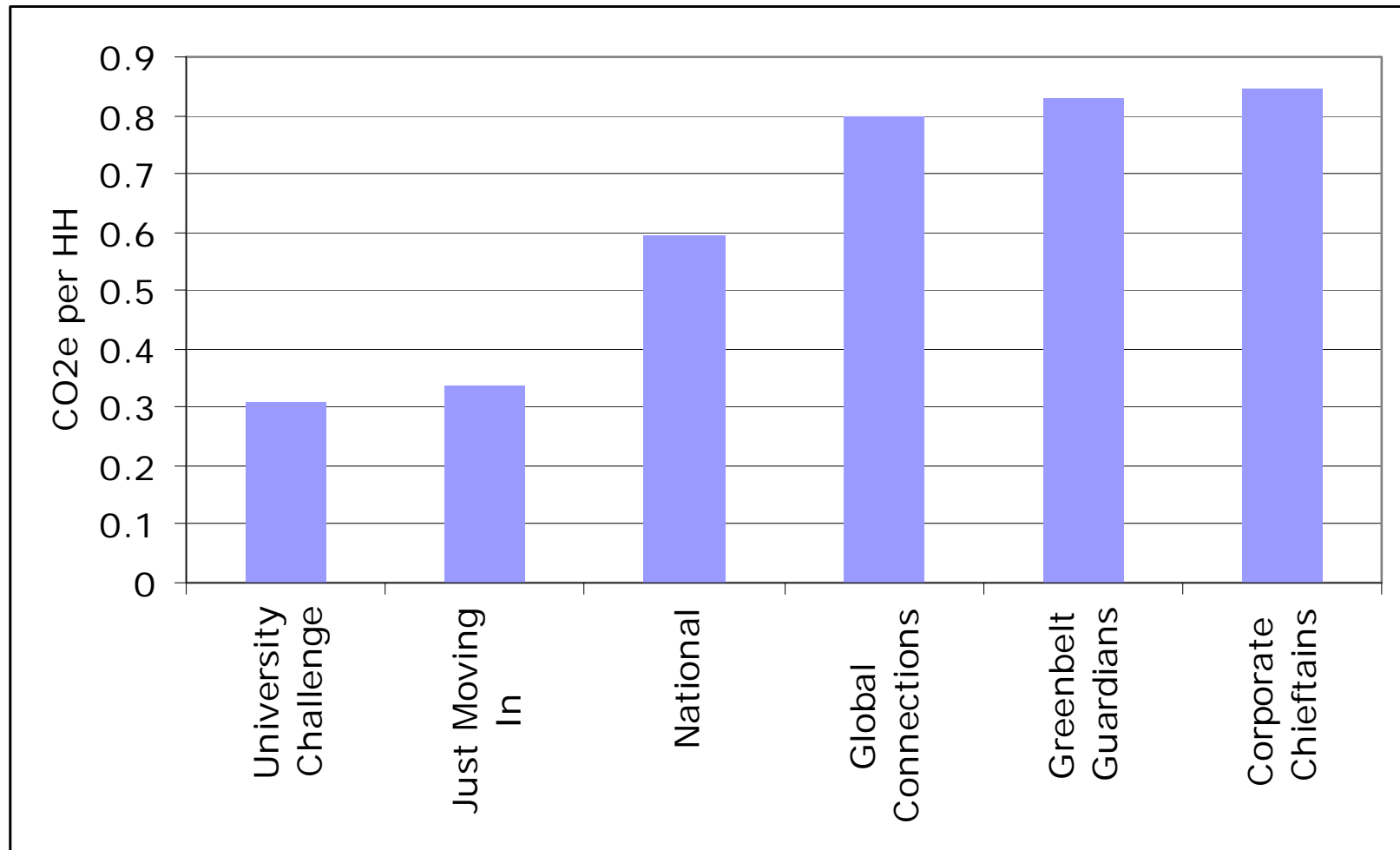
Environmental Impact by Household Product Groups



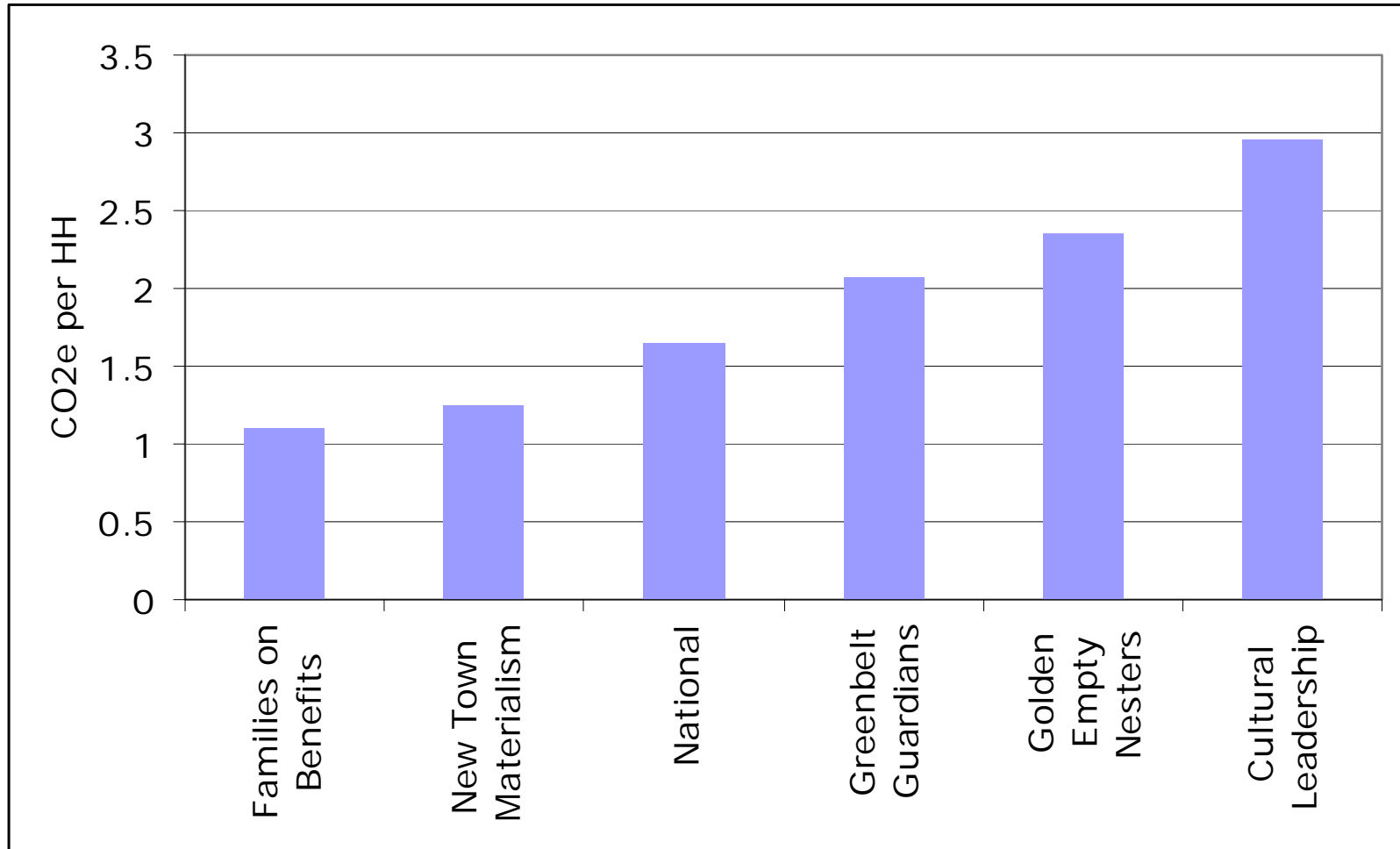
Environmental Impact by Mosaic Types




MOSIAC Groups - Meat



MOSIAC Groups - Electricity



What else do we know about 'Caring Professionals?'

Help Exit

E31 Caring Professionals (1.18%HH) 28 29 30 31 32 33 34

- A 1-7
- B 8-14
- C 15-20
- D 21-27
- E 28-34
- F 35-40
- G 41-43
- H 44-47
- I 48-50
- J 51-56
- K 57-61

"Andy and Beth"

Well qualified singles and couples in caring professions renting lower quality inner terraces

Age Rank: 13/61

Wealth Rank: 31/61

Most likely types to move to:
1. D21 Respectable Rows
2. F37 Upper Floor Families
3. F38 Tower Block Living
4. C19 Original Suburbs

Portrait

Regional Distribution

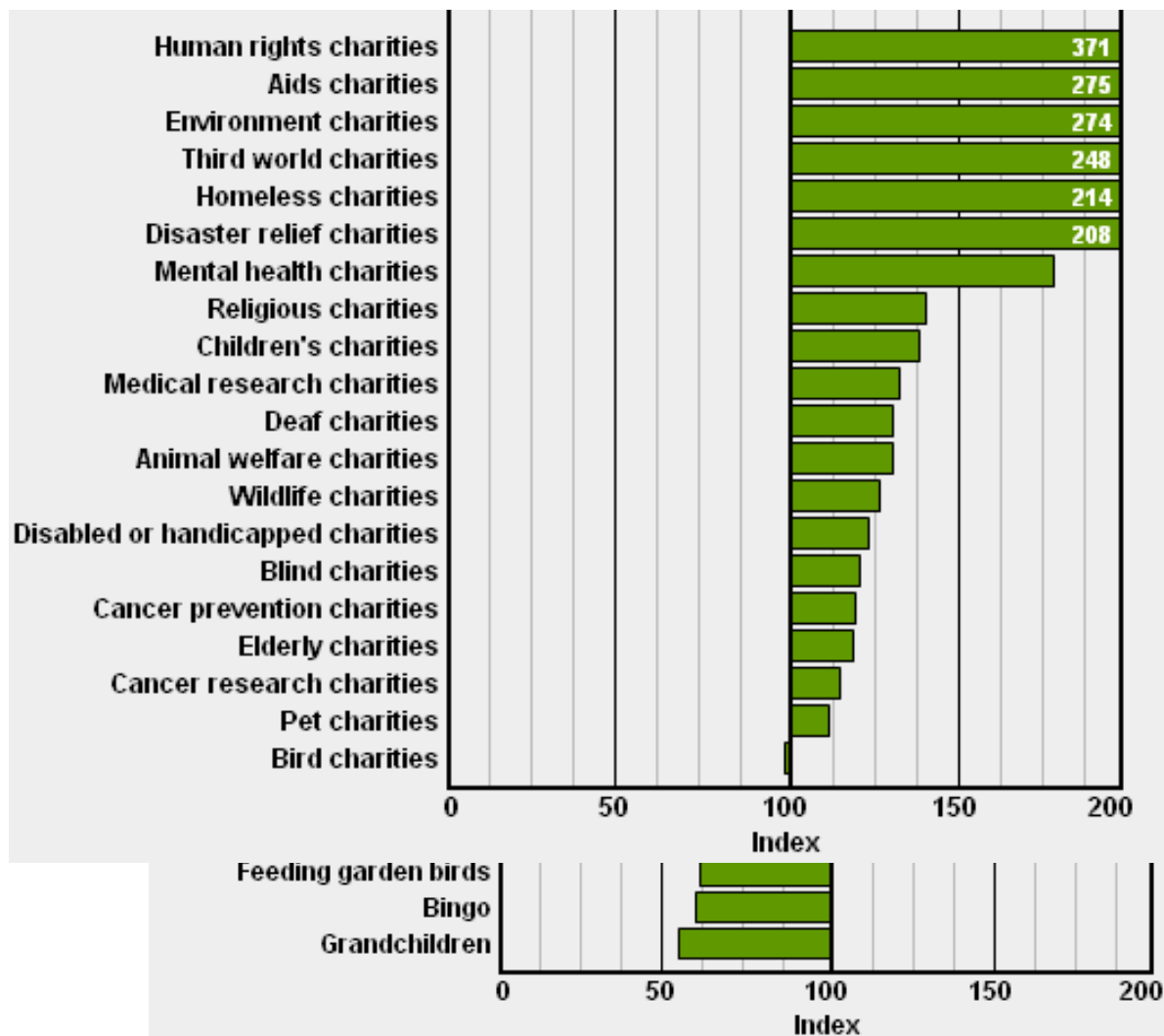
London (4.68%)

South East (23.66%)

Mosaic Lookup

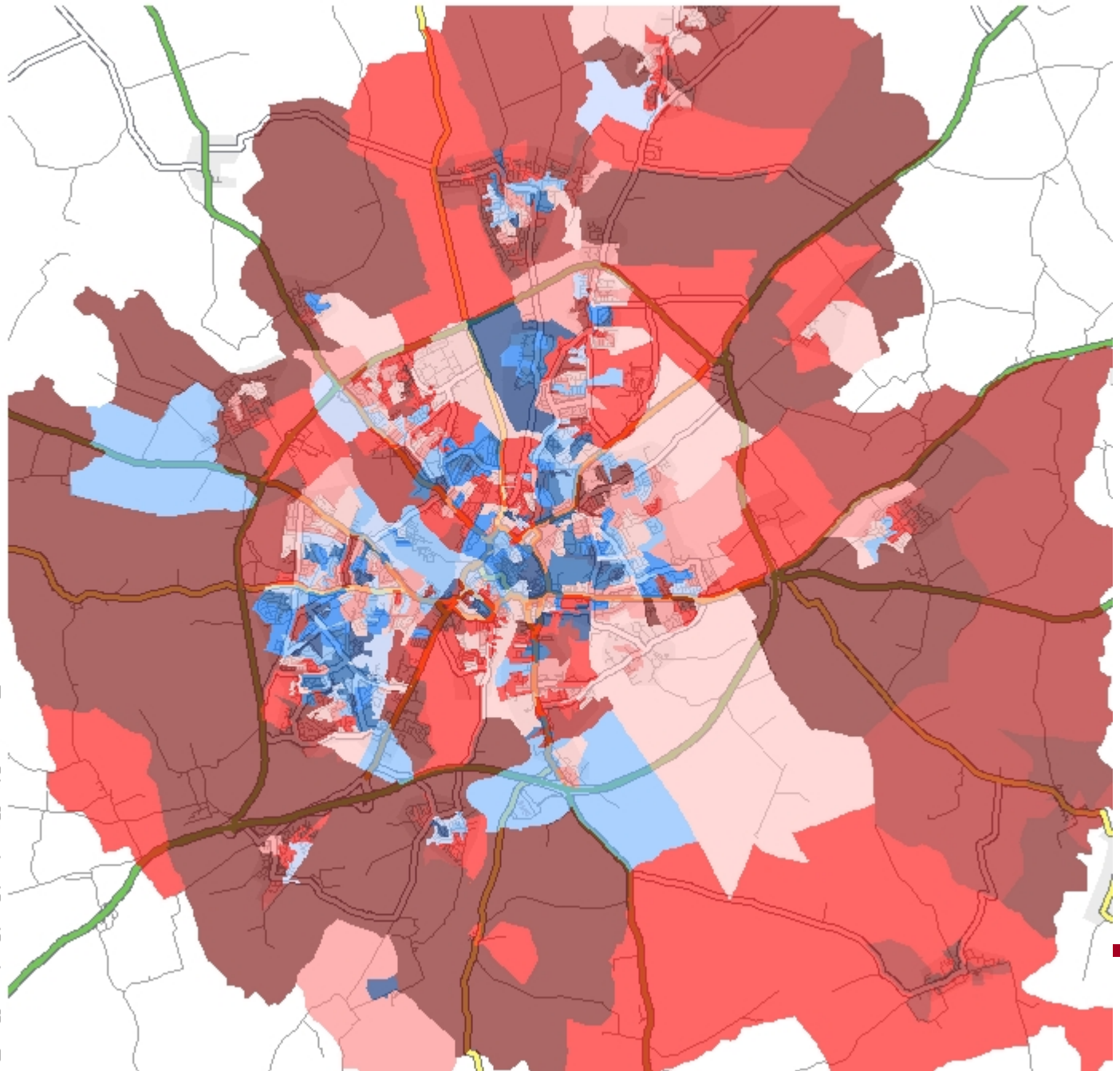
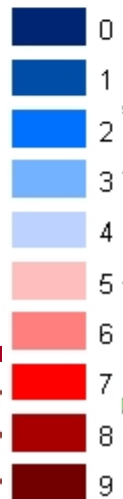
What else do we know about 'Caring Professionals?'

- Young professionals working in public sector
- Living in small terraced homes – high density but close to parks
- Not responsive to 'branded' products
- High spend on travel and organic veggie food
- Read The Independent and The Guardian
- Vote Liberal Democrat or Labour
- Internet users



York
Total household carbon dioxide emissions

Decile



Attitudes towards 'Green issues'

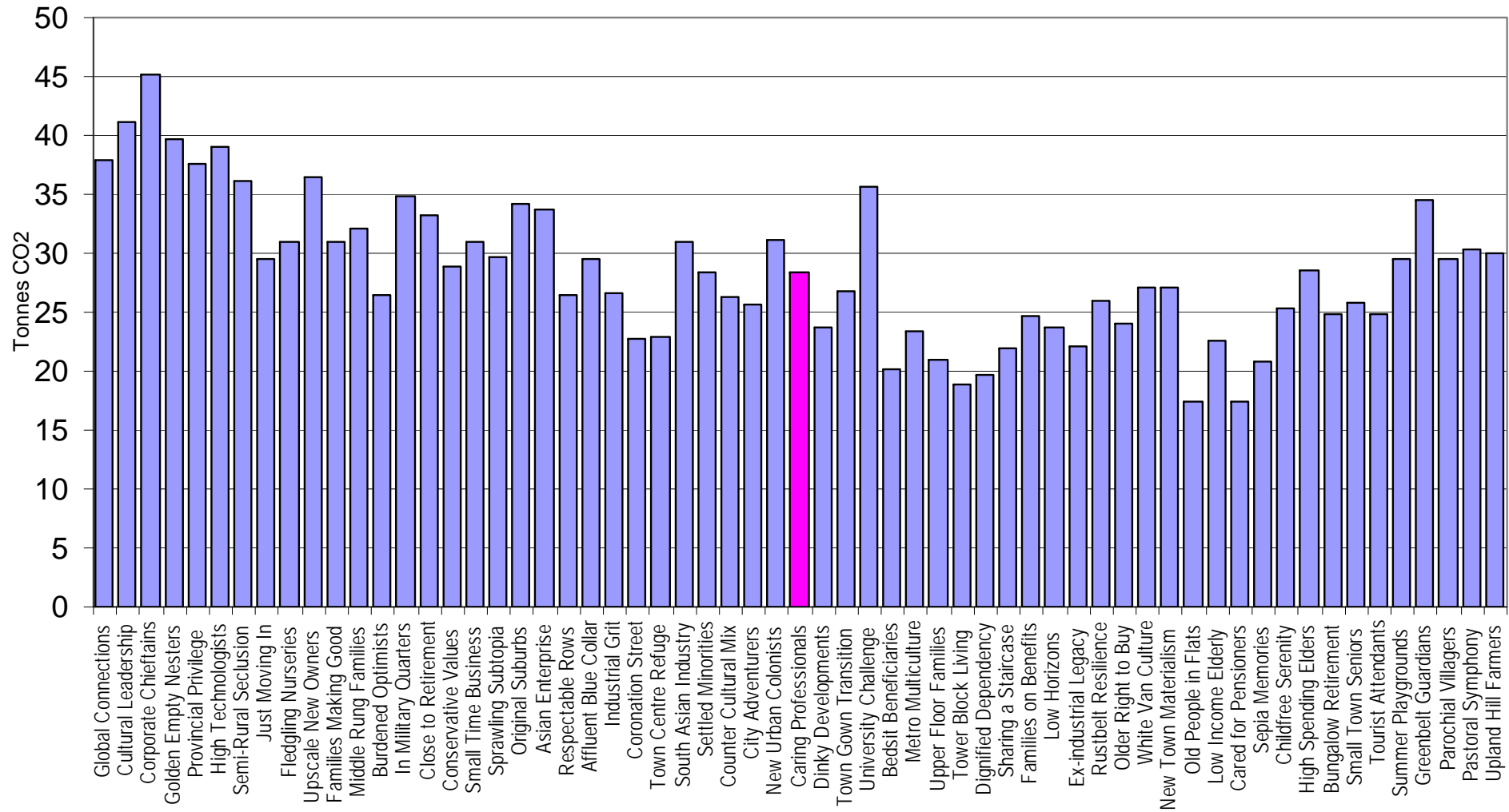
Legend

GreenAware Green Segments

- Type 01: Eco-evangelists
- Type 02: Convinced consumers
- Type 03: Green but doubtful
- Type 04: Confused but well-behaved
- Type 05: Doing their best
- Type 06: Sceptical libertarians
- Type 07: Too busy to change
- Type 08: Why should I bother?
- Type 09: Constrained by price
- Type 10: Wasteful and unconvinced



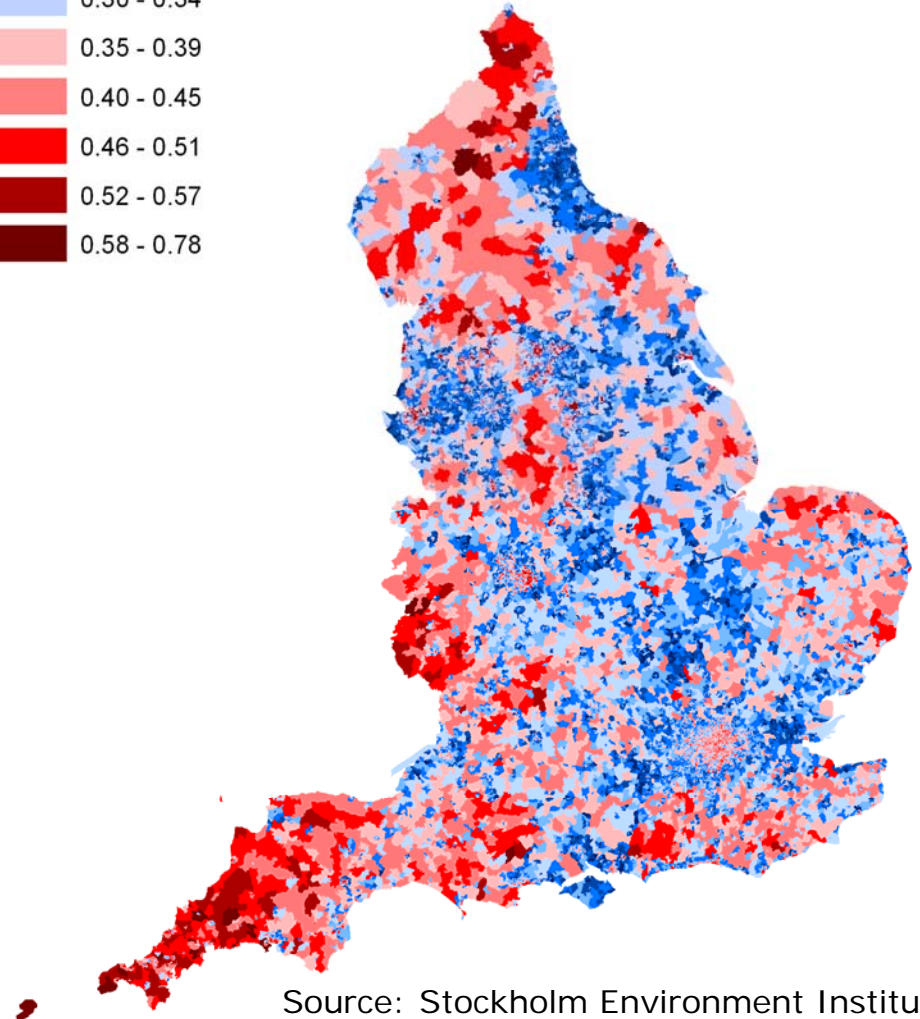
Environmental Impact by Mosaic Types



- Can the link be made between poor quality homes and a high housing impact?
- Which groups and which part of the country will experience the greatest change in impact due to housing policy?

Houses in poor condition

Score from IMD 2007 where high = most deprived

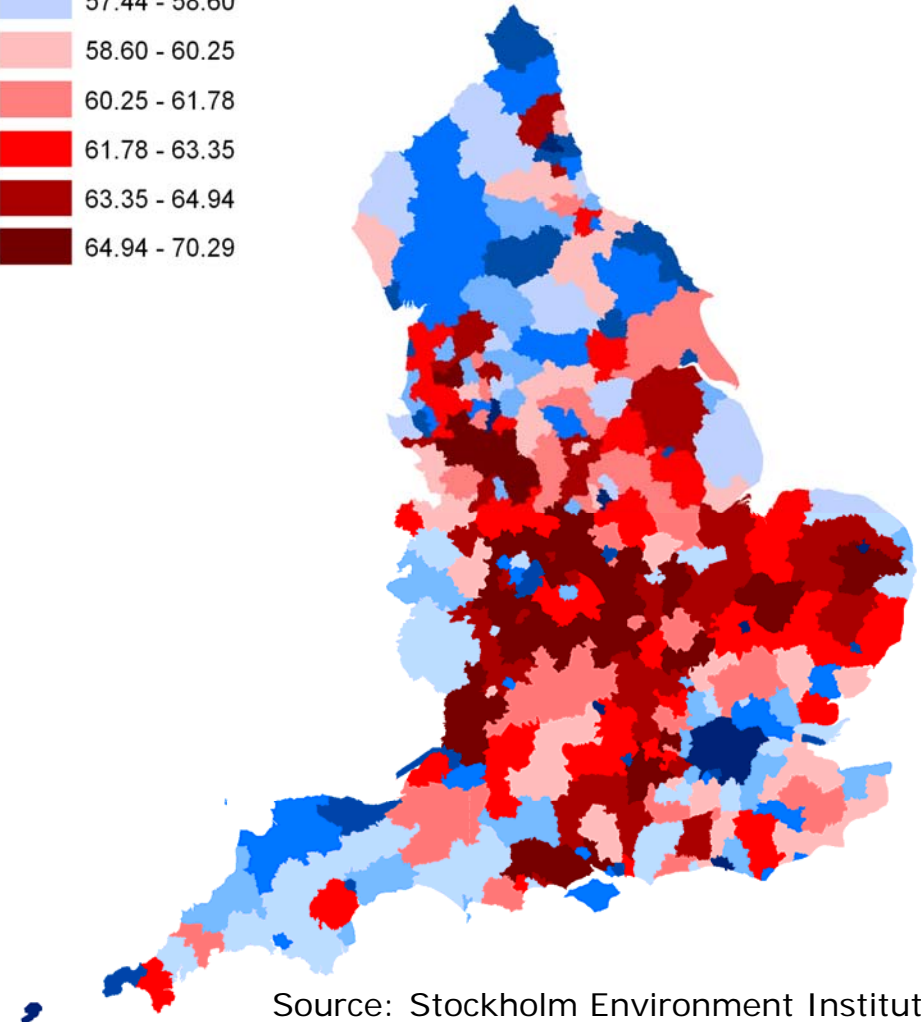


Source: Stockholm Environment Institute

- Can the link be made between infrastructure and transport footprint?
- What conditions (eg high housing density, good access to services, public transport) lead to low carbon lifestyles?
- What are impacts of future suburban living?

Travel to work by car

Percentage of people aged 16 - 74

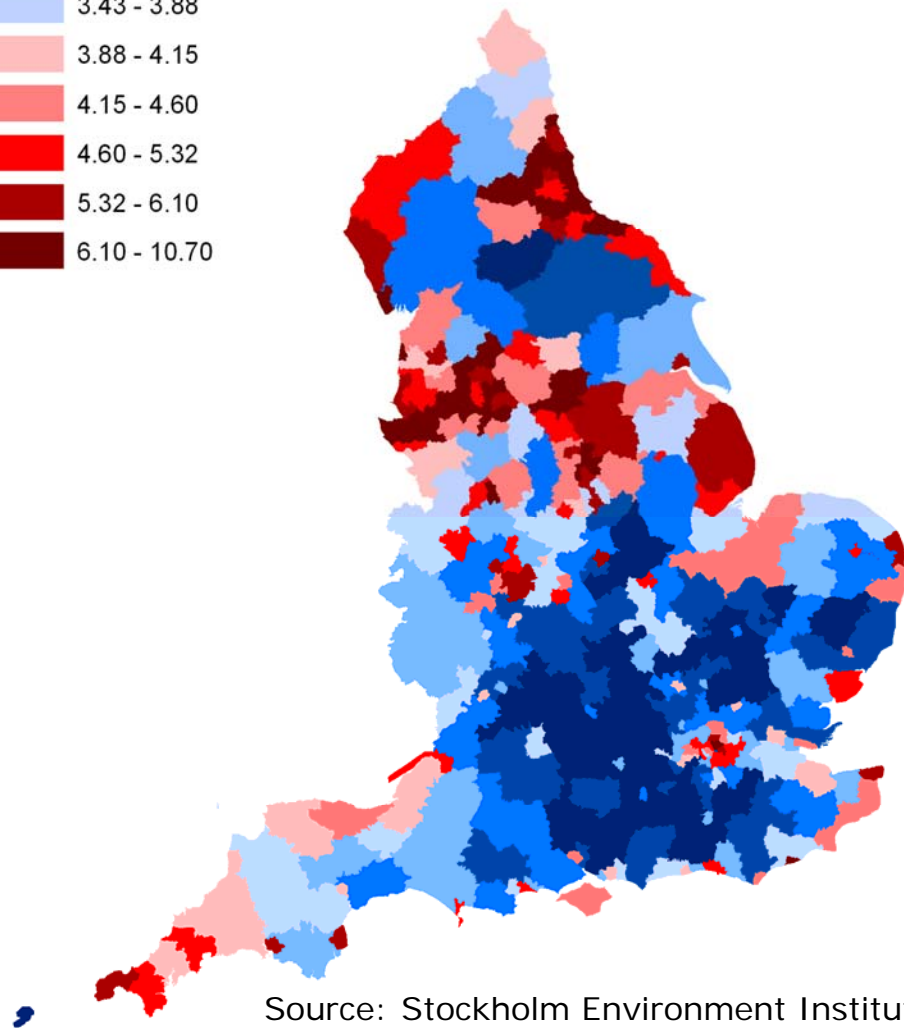


Source: Stockholm Environment Institute

- Can any links be made between health and footprint?
- Is a low footprint diet a healthy one?
- What are the barriers present which may prevent certain members of a community leading a low footprint lifestyle?

Incapacity benefit / severe disablement allowance claims

Percentage of population



Source: Stockholm Environment Institute

Conclusions – Incentive Systems

- Refine Values
- Infrastructure
- Fiscal
- Awareness