Compensating for climate mitigation: Can social policies ameliorate the regressive effects?

Grantham Institute seminar
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CASE, LSE

The problem

- *'The lower VAT rate on household energy should be abolished to achieve more uniform carbon taxation, with more targeted tools being used to ameliorate the distributional consequences'*
  - (Alex Bowen and James Rydge, Grantham/OECD Report *Climate Change Policy in the UK*).
- This paper shows how problematic such compensation is, yet without it popular opposition to climate mitigation could build.

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The REAL reason fuel bills are going through the roof? Crackpot green taxes you're never even told about

Daily Mail

By Dr Benny Peiser

Spurred by the Government's stubborn but wrong-headed commitment to renewable energy, so-called green stealth taxes are already adding 15-20 per cent to the average domestic power bill and even more to business users.

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Plan of presentation

- Chart distribution of emissions by income and other characteristics
- Discuss potential forms of social compensation and alternative ways to 'mitigate mitigation'

Do this in two parts:

Part A: normal Kyoto-style calculation of nationally –*produced* emissions

Part B: post-Kyoto calculation of all emissions resulting from *consumption* within UK

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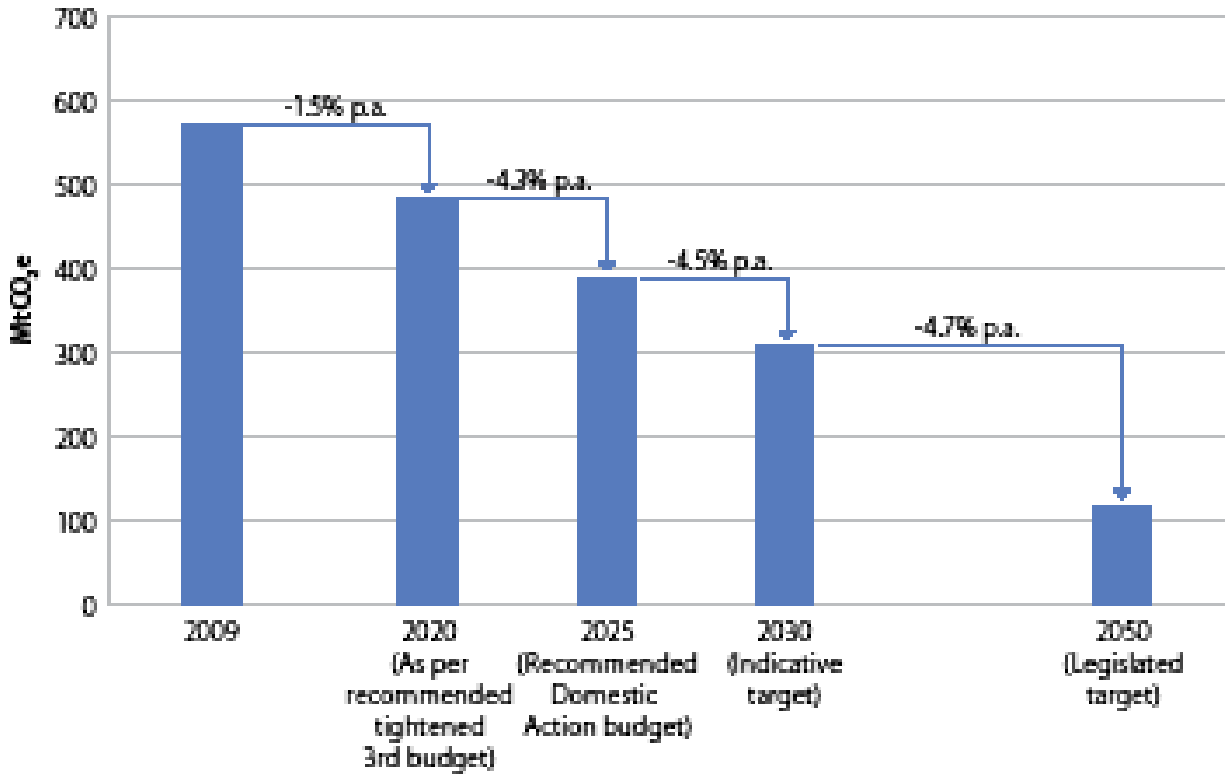
Part A: Official UK GHG targets

Figure 7: Rate of reduction of greenhouse gas emissions, excluding international aviation and shipping (2009-2050)



Source: NAEI 2010, CCC analysis.

Plethora of carbon mitigation programmes

Those directly impinging on household sector include:

- Obligations on suppliers, some targeted on low income households
  - Renewables Obligations, Carbon Emissions Reduction Target, Feed-In tariffs, now Energy Company Obligation.
  - Total expenditure 2009-10: £2.3b
- Direct government programmes
  - Decent Homes, Warm Front
  - Total expenditure 2009-10: £1.1b
  - Outweighed by compensation: Winter Fuel Payments £2.7b
- Obligated spending exceeds direct government spending; both small; but future New Deal
- Supplier obligations financed by raising energy prices

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DECC 'Estimated impacts of energy and CC policies on energy prices and bills' 2010

- Prices>>bills, very optimistic
- Bill figure difference between two large flows
- Assumes no rebound
  - Average indoor temp rose 3◦C 1970-2009

Change to 2020	domestic	business
Gas	+18%	+24%
Electricity	+33%	+43%
Combined bills	*+1%*	*+26%*

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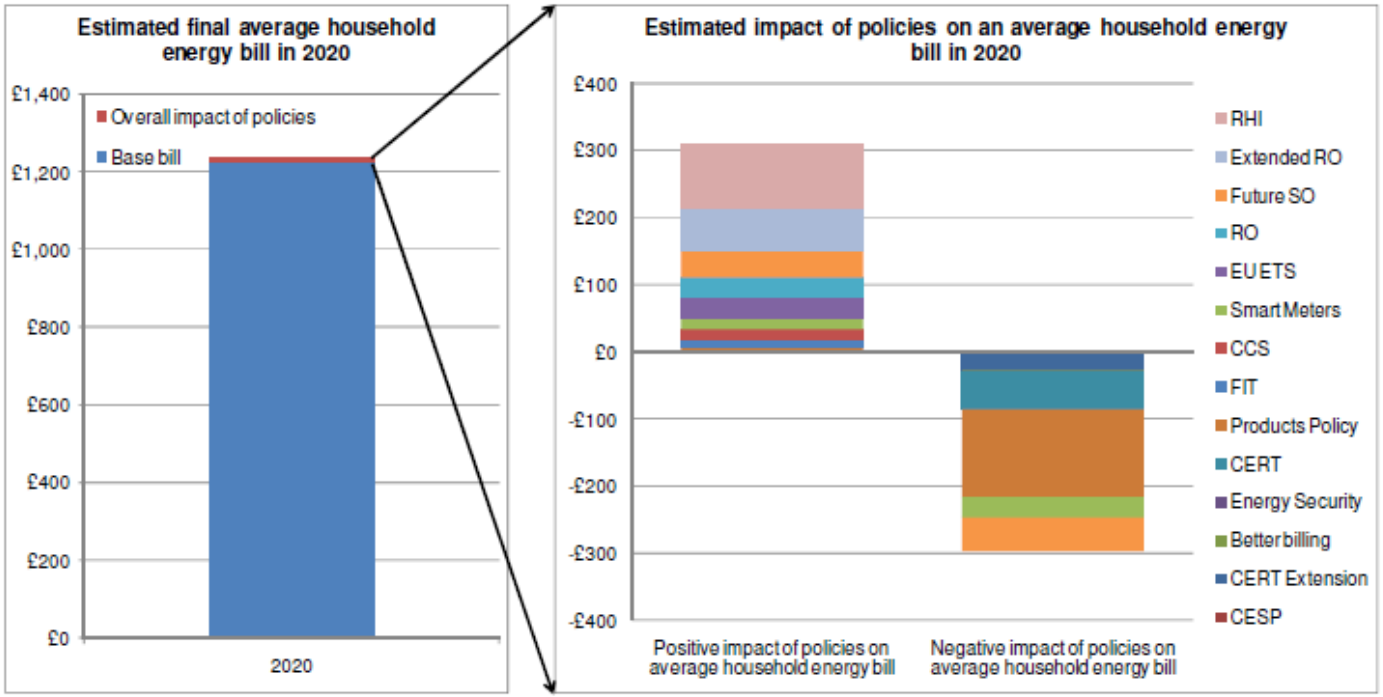
This difference between two large flows….

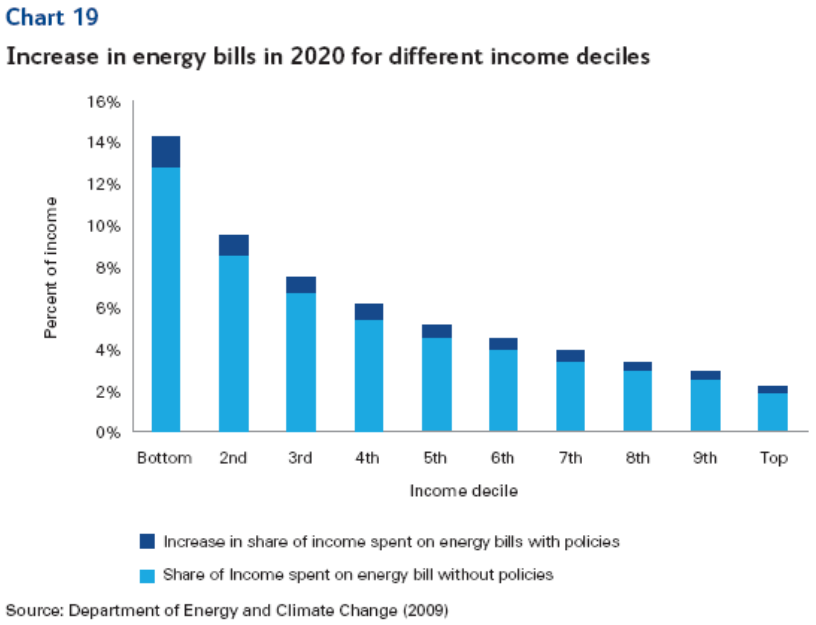
Chart 3: Estimated impact of energy and climate change policies on an average domestic energy bill in 2020 (including VAT)



Source: DECC 2010
Figures in real 2009 prices

DECC estimate of distribution

- Distributional impact in 2020 sharply regressive
- Those taking up insulation measures: -7%
- Those taking up insulation + renewables: -25%
- Those with neither +2%
- Assumes no rebound
  - Poor take out more energy savings as comfort



Contributing to rising ‘fuel poverty’

- Warm Homes and Energy Conservation Act 2000: ‘fuel poverty’ defined as
  - A member of a household living on a lower income in a dwelling which cannot be kept warm at reasonable cost
- 2001 measure:
  - Where a household needs to spend more than 10% of its income on total fuel in order to heat its home to an adequate standard (21^{o}C in living room and 18^{o}C in other occupied rooms in daytime hours)
- The concept and measurement reviewed by Prof Hills
- But these policies ‘could have a negative impact on fuel poverty’

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CSE/Defra 2008 study

Distributional impacts of personal carbon trading

- Studies household emissions from domestic energy and private cars
- Even with equal per capita carbon allowances – a progressive impact – still find many 'low income losers' (8% of households):
  - large families in rural, hard-to-heat houses,
  - 'empty-nesters' in large houses and houses without gas central heating,
  - retired under-occupied urban households
- Conclusion: hard to compensate rising energy costs via social benefits: heterogeneity of households and dwellings

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Ongoing analysis of CMPs and potential compensation packages

- A study by PSI, CSE and IFS:
- Model carbon pricing scenarios:
  - including raising VAT on domestic energy to 20% (raises ~£4.25b) and extending the Carbon Price Floor to gas (+~£1.63b)
- They find the expected regressive distributional impact
- Then devise a compensation package

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Tax plus compensation

- This suggests targeted compensation packages can be devised
- Winners in bottom 3 deciles outnumber losers 45-60% v 15-25%
- Pattern reversed above median incomes
- But still substantial numbers of losers:
  - Single working persons
  - Working families with children
- Losers have more political impact?

Alternatives to compensation: ‘eco-social’ policies: retrofitting

The only long-term solution

- Green Deal:
  - will meet capital costs through later charges on energy bills. Once repaid, lower bills (assuming no rebound). People in fuel poverty to be helped via ECO. But still await details
- Alternative: Skidelsky’s scaled up Green Investment Bank with £10b fiscal commitment
- Skirt this here
  - Cutting Carbon Costs: Our big energy battle, LSE conference 8 Nov
- But even a crash programme would take at least a decade. In the meantime…..

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A low-income price index?

- Use to uprate tax allowances, benefits, minimum wage?
  - UK inflation rates 2000-10: lowest quintile 3.4%, highest decile 2.9% (IFS 2011).
  - Especially driven by gas and electricity prices
- DECC projections will drive up low income inflation,
  - even though lower income households exhibit greater price elasticity than higher income; ie consumption will likely decline as well as costs paid increase.
- Therefore a separate index for low income and pensioner households and workers on the minimum wage in an era of steadily rising oil (and food) prices?

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Social energy tariffs?

- Lower costs of initial units of energy: recognises the 'basic need' component and progressive choice element in successive units
  - Ofgem (2009) model of lower electricity charges for the first 2000kW hours per year and then rise sharply:
  - Progressive, and exerts price constraints on higher user households
- Raised by the Climate Change Committee (2008), but would entail radical shift towards de-liberalisation and regulation?
- Current 'choice' agenda:
  - 400+ tariffs now, 40% worse off after switching, substantial public opposition (Hills Report)

Some conclusions

- Uncompensated energy price rises very regressive
- Supplier obligations regressive due to burden on all consumers and differential uptake of energy saving and carbon reduction
- New carbon taxes yield revenues which could be used for targeted compensation
- But there would remain many losers, including in low income households, because of heterogeneity in CO2 emissions

Conclusions cont.

- Retro-fitting essential but expensive
  - 25m dwellings..
  - Better *targeting* of retrofitting may conflict with street-by-street programmes, but need both
- All programmes entail growing throughput of public finance… except social energy tariffs
  - this would increase fiscal competition in time of cuts
  - But would stimulate economy in recession
- This raises wider questions -Plan A versus Plan B: time to stop!

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PART B: POST-KYOTO: FROM PRODUCTION TO CONSUMPTION

- But this only half the story
- Move beyond Kyoto from greenhouse gases *produced* in the North to those embodied in Northern *consumption*
- Globalisation fostering a widening gap
- OECD report for 2000:
  - OECD excess 1.95bt CO2
  - Non-OECD deficit 1.1bt CO2

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The UK emissions gap

Our estimates of 2006 UK consumption-based emissions:

- CO2 emissions **33% higher** than produced
- all greenhouse gases **51% higher** (16.2 tonnes per head v 10.7 tonnes)
- one of the biggest gaps in the world, due to deindustrialisation in Britain and the high import ratio

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Carbon gap +33%; GHG gap +51%

UK, 2006	*Carbon emissions CO2*			*All greenhouse gas emissions: CO2e*		
	Production-based	Consumption-based	Difference	Production-based	Consumption-based	Difference
Total emissions	551mT	733mT	+182mT	650mT	984mT	+334mT
Emissions per capita	9.1T	12.1T	+3.0T	10.7T	16.2T	+5.5T

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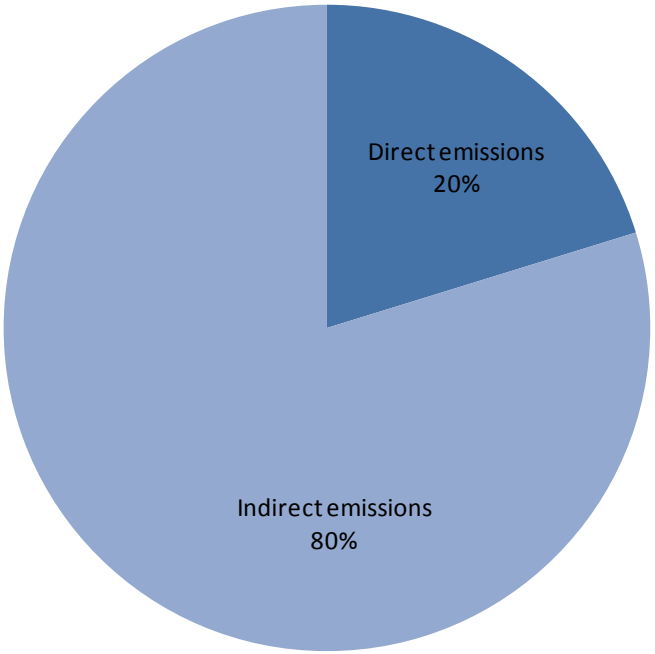
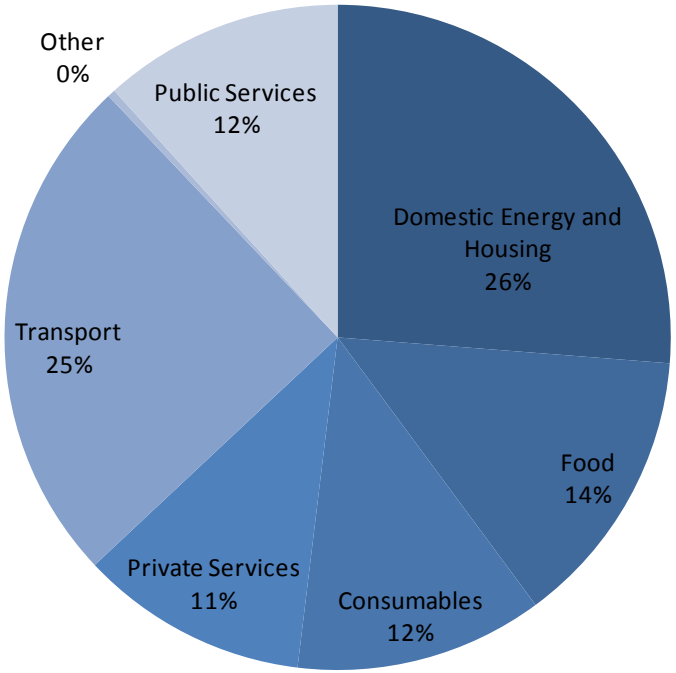
Pie chart of total emissions





Distribution of all household emissions: Nef-CASE study

- Embodied emissions account for 80% of total – embodied in food, housing, other travel, consumables, private services etc
- Nef-CASE study overcomes this by marrying
  1. Stockholm Environment Institute's (SEI) *Resources and Energy Analysis Programme* (REAP) - an input-output model, with
  2. *Expenditure and Food Survey* on distribution of 80 consumption categories, both for 2005
     - Gough et al, *The distribution of total embodied greenhouse gas emissions by households in the UK, and some implications for social policy*. CASE paper 152

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Methods

- Household income is equivalised
  - % Children in lowest income decile: 15% using total household incomes; 41% when equivalised
- Also distinguish 7 household types:
  - Single 60+, two+ persons 60+, single 60-, two adults 60-, single parent + children, two+ adults + children, three+ adults
- Dependent variable is GHG emissions per capita

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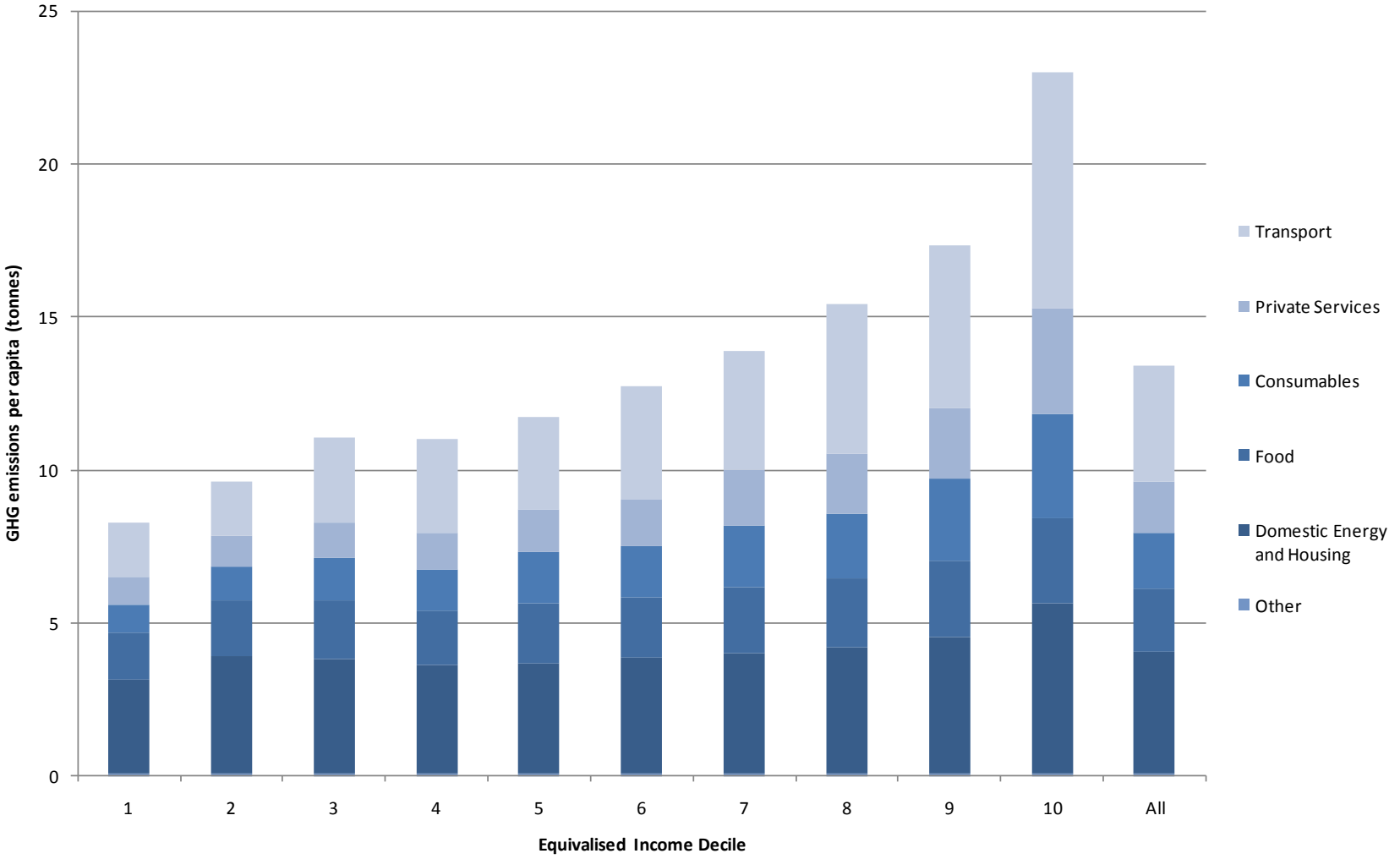
Emissions by income decile



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But as a share of income the opposite

- Convert per capita emissions into per capita emissions per £100 income
- The slope of the income decile line is reversed:
  - Inequality of decile incomes (11:1) far exceeds ratio of emissions (2.8:1)
- Ratio of emissions/£: decile 1/ decile 10
  - Total 4:1
  - Food, energy housing 6:1
  - Consumables, services 3:1
  - Transport 2.5:1

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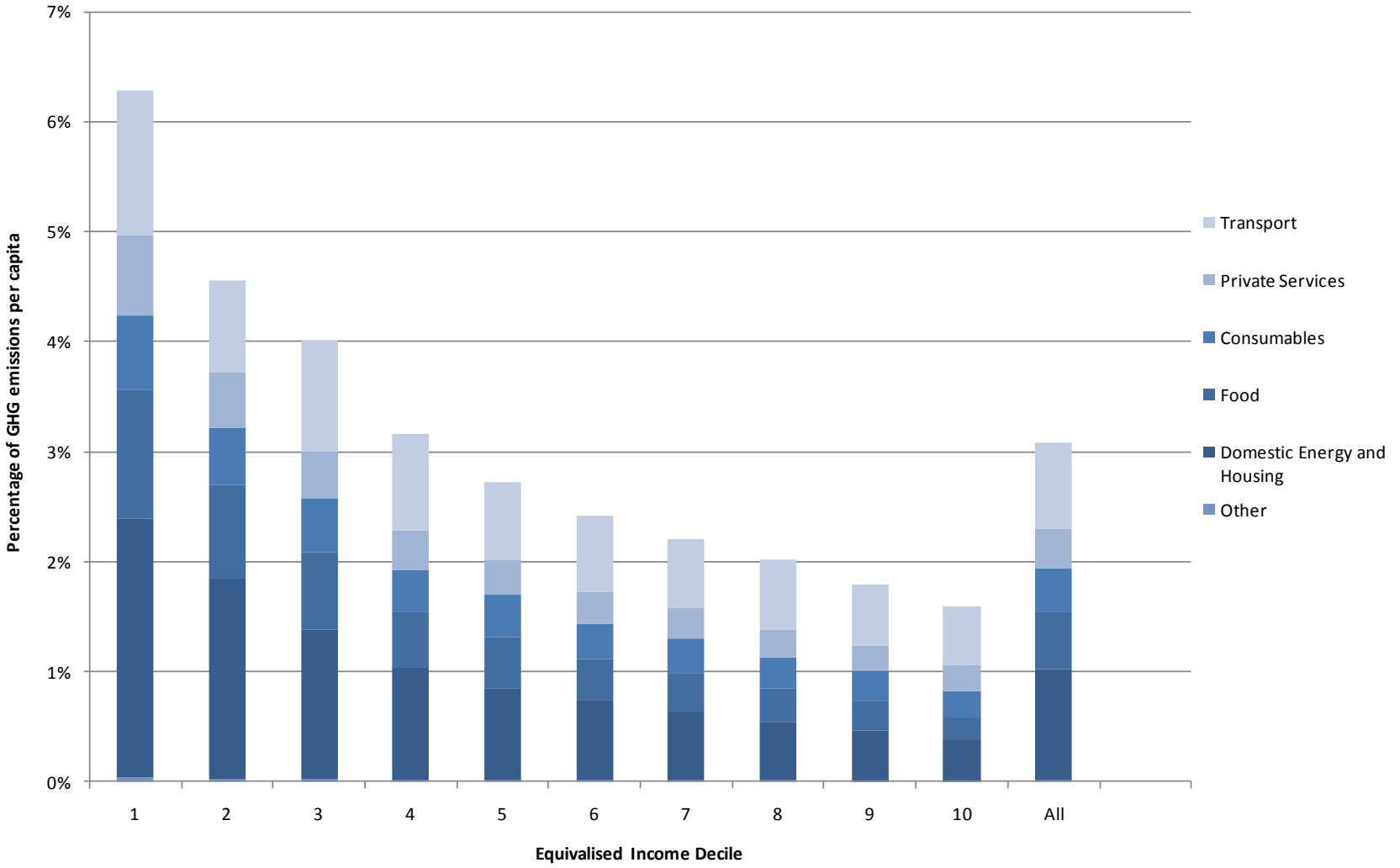
Emissions/income by deciles



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Basic regression model

Log Per Capita GHG Emissions	Coefficients	Standard Error	T-Statistic
Intercept	-3.12494	0.032	-96.36
Equivalised income	-0.00086	0.000	-43.29
Households with two or more people aged 60+	-0.13555	0.023	-5.90
Households with only one person under 60	0.02588	0.032	0.81
Households with two adults, no children	-0.12882	0.029	-4.38
Single parent households	-0.36312	0.036	-10.21
Households with two+ adults, and children	-0.42225	0.030	-14.23
Households with three+ adults, no children	-0.27472	0.033	-8.26
Part time employed	0.13416	0.024	5.51
Retired	0.13873	0.028	5.02
Self employed	0.20633	0.024	8.77
Unemployed	0.35095	0.048	7.26
Unoccupied	0.31779	0.022	14.13
Adj R^2 =0.421			

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Results

- Explains 42% of variance in GHG emissions per head
  - Income by far most important driver of total GHG emissions (+ve), and emissions per £ (-ve)
  - Single householders emit most per person
  - Workless households (retired, unemployed and unoccupied) experience higher ratios of emissions to income
- Therefore any general rise in carbon price will hurt low incomes, small and workless households most
- But:
  - regressiveness much less than for domestic energy
  - And: variation within income deciles less
- Thus compensation less problematic

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Social policy for a post-Kyoto world: some speculative thoughts

- Targeting a broader range of embodied emissions less regressive than current supplier obligations
- Requires broader carbon taxes and/or upstream cap-and-trade
- ETS useful since targets designated emissions across EU
- To go beyond this requires border levelling
  - UNEP-WTO joint report 2009 positive about some trade measures to counter effects of different environmental regimes

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Target consumption: three radical alternatives

Alongside existing and planned CMPs

- Target consumption – and excessive consumption - directly
- Use additional policy tools alongside market incentives:
  - Regulation
  - Citizen engagement for behaviour change

1. Personal carbon allowance
2. Reduce working time
3. Tax consumption/ income

1. Personal carbon allowance/ ration

- Cap emissions and allocate equal annual allowance to all (adults? Citizens?)
- Dual 'price' - £ and carbon credits – for specified goods/ services
- Trading between low and high emitters
- Inherently progressive
- Would directly motivate behaviour change
  - Confronts the 'rebound factor'

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PCA problems

– Special issue of *Climate Policy* 10 (2010)

- Administrative difficulties
- Difficult to bolt onto ETS
- Cannot extend to ‘diffused and international emissions’
- Little international resonance
- Defra: ‘ahead of its time’
- ‘Case unproven’?

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2. Reduce consumption by reducing working time?

- Take out productivity increases in leisure not consumption?
  - Average hours worked per year in 2003: US 1817, Netherlands 1429
- US model of tight carbon reduction policies up to 2050:
  - reduces real GDP by 4.1% compared with BAU, but household 'full consumption' (including value of leisure) falls by only 0.3%
    - Dale Jorgenson et al *The distributional impact of climate policy*, B.E. Journal of Economic Analysis and Policy 10.2 2010.
- Time to value leisure in GDP

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New time policies

- New time policies:
  - eg.Belgian Time Credit Scheme: workers accumulate rights to career breaks etc
- But risk of rising poverty for low paid
- Also growing time inequality
  - high income groups would have a greater capacity to reduce work hours without harmful effects
  - Some households are both income-poor and time-poor (Burchardt); working time reduction would worsen this dilemma for low income families

C. Tackle inequality: tax consumption/ income

- Context of rising inequality:
  - surge in income shares since 1980 of top 0.1%, 0.5%, and 1.0% (from 5% to 10%)
  - This driving spike of consumption/emissions in top decile (second homes, air travel, services)
- Tackle high income/ consumption/ emissions:
  - Tax luxury consumption emissions
  - Reduce positional competition

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Conclusion

'Attributing emissions to the state which hosts their production remains the pre-eminent means of accounting… Any changes to this notion… would profoundly reshape assessments of national responses to climate change' (Christoff and Eckersley 2011)

- Tackling emissions embodied in consumption raises different research questions
- It suggests more radical policy integration across economic, social and environmental domains
  - *Nef conference on 'carbon, income and time' January*

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