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Reforms to household energy use policy

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Esmée Fairbairn FOUNDATION

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

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Outline of the talk

- Harmonisation of carbon prices.
  - Show how one could reach the government's target price.
  - Principle of the reform applies whatever the target price is.
- Distributional effect of harmonisation.
- Potential compensation package.
  - Show how one could compensate poorer households in a practical way.
  - Provide compensation only using revenue raised from the higher domestic carbon price.
- Reforms to other policies.

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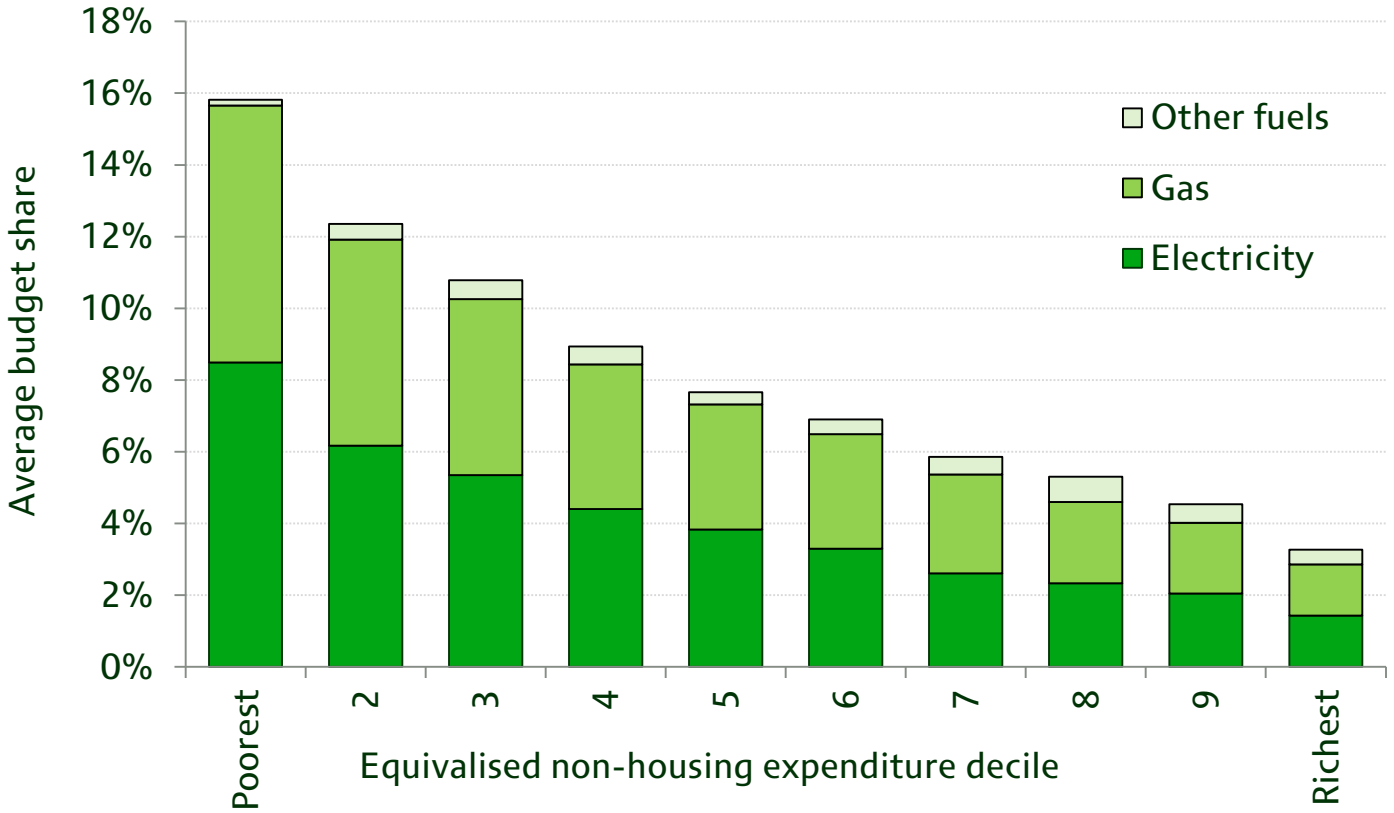
Distribution of energy budget shares



Source: Figure 3.6 of "**Household energy use in Britain: a distributional analysis**"

- Energy makes up 16% of spending for poorest 10%; 3% of spending for richest 10%.

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Harmonisation of carbon prices

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Background

- DECC publish an estimated "non-traded carbon price" consistent with meeting the government's carbon emissions reduction targets.
  - For 2013 this "target price" is £59/tCO_2e.

- Carbon price faced by households is significantly below government target.
  - Businesses already around this level for electricity, although significant variation.

- Carbon price from gas use is lower than from electricity use.
  - Seen already that electricity would be close to target if full-rate VAT were levied.

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Potential reform to carbon prices

- Potential reforms:
  - Introduce a gas tax of 0.8p/kWh (average retail price is 4.8p/kWh).
  - Introduce full rate VAT on both electricity and gas.

- Combined effect takes us close to target price for both fuels.

- A similar structure of reform could be used to achieve a different "target" if desired.

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Current prices

	2013–4 unit price (p/kWh, estimate)	Post-reform unit price (p/kWh)	Change (%)	Pre-reform carbon price (£/tCO_2e)	Post-reform carbon price (£/tCO_2e)
Electricity	15.60			5.92	
Gas	4.83			-18.92	

- At the moment implied carbon prices for households are below the £59/tCO_2e non-traded carbon price.

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Effect of proposed reform on energy prices

	2013–4 unit price (p/kWh, estimate)	Post-reform unit price (p/kWh)	Change (%)	Pre-reform carbon price (£/tCO_2e)	Post-reform carbon price (£/tCO_2e)
Electricity	15.60	17.83	14.3%	5.92	
Gas	4.83	6.47	34.0%	-18.92	

- Clearly this change is large, so wouldn't want to do it all at once.
  - Also a case for pre-announcing, to give people time to install measures.
- For comparison:
  - Electricity prices rose by 15% between August 2011 and May 2013.
  - Gas prices rose by 33% between November 2010 and May 2013.

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Harmonisation of carbon prices

	2013–4 unit price (p/kWh, estimate)	Post-reform unit price (p/kWh)	Change (%)	Pre-reform carbon price (£/tCO_2e)	Post-reform carbon price (£/tCO_2e)
Electricity	15.60	17.83	14.3%	5.92	58.65
Gas	4.83	6.47	34.0%	-18.92	56.05

- Reform takes us close to £59/tCO_2e.

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Implications - initial

- Price rises similar to those seen in recent years.
  - But, can use the revenue raised to provide compensation.

- If one assumes no change in energy demand, this raises £8.3 billion.
  - For comparison, the OBR estimates energy-related taxes raised £3.0 billion in 2012-13.
  - This is composed of CCL, EU ETS, CRC, RO, FITs, WHD.

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Implications – short term

- Price rise reduces household demand.
  - Around 4% for electricity.
  - Around 10% for gas.
- Also raises average bills by £300.
- Expect to raise £7.5 billion accounting for this.
- Emissions to fall by eight million tonnes of CO_2e per year.
  - 1.4% of total annual UK emissions.

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Implications – long term

- Over longer horizon people will replace boilers and other appliances.
  - Some replacement would happen anyway…
  - …but higher energy prices encourage both production and take-up of more efficient models than without this.

- Expected saving of 22 million tonnes of CO_2e per year.
  - 4% of total annual UK emissions.
  - Worth around £1 billion a year.

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Interactions with announced future policy

- Built into current policy are changes that would, in the absence of these reforms, increase the electricity carbon price to £27/tCO_2e.

- Removing the VAT subsidy gives carbon price of £126/tCO_2e by 2020.
  - Well above the non-traded carbon price of £66/tCO_2e.

- Certainly wouldn't want this.
  - But, important to note that businesses will face these sorts of prices unless some reforms are made.

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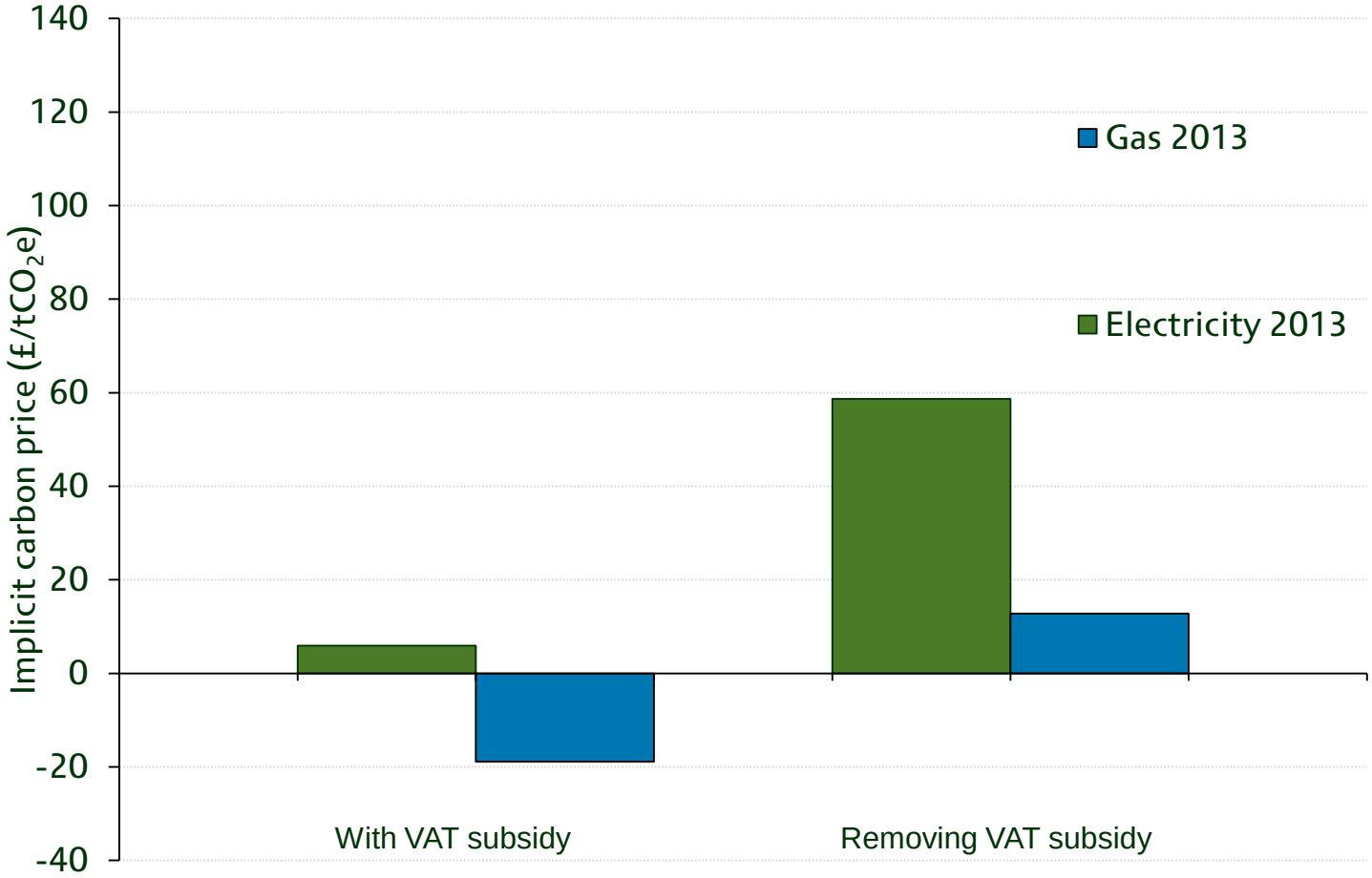
Interactions with announced future policy



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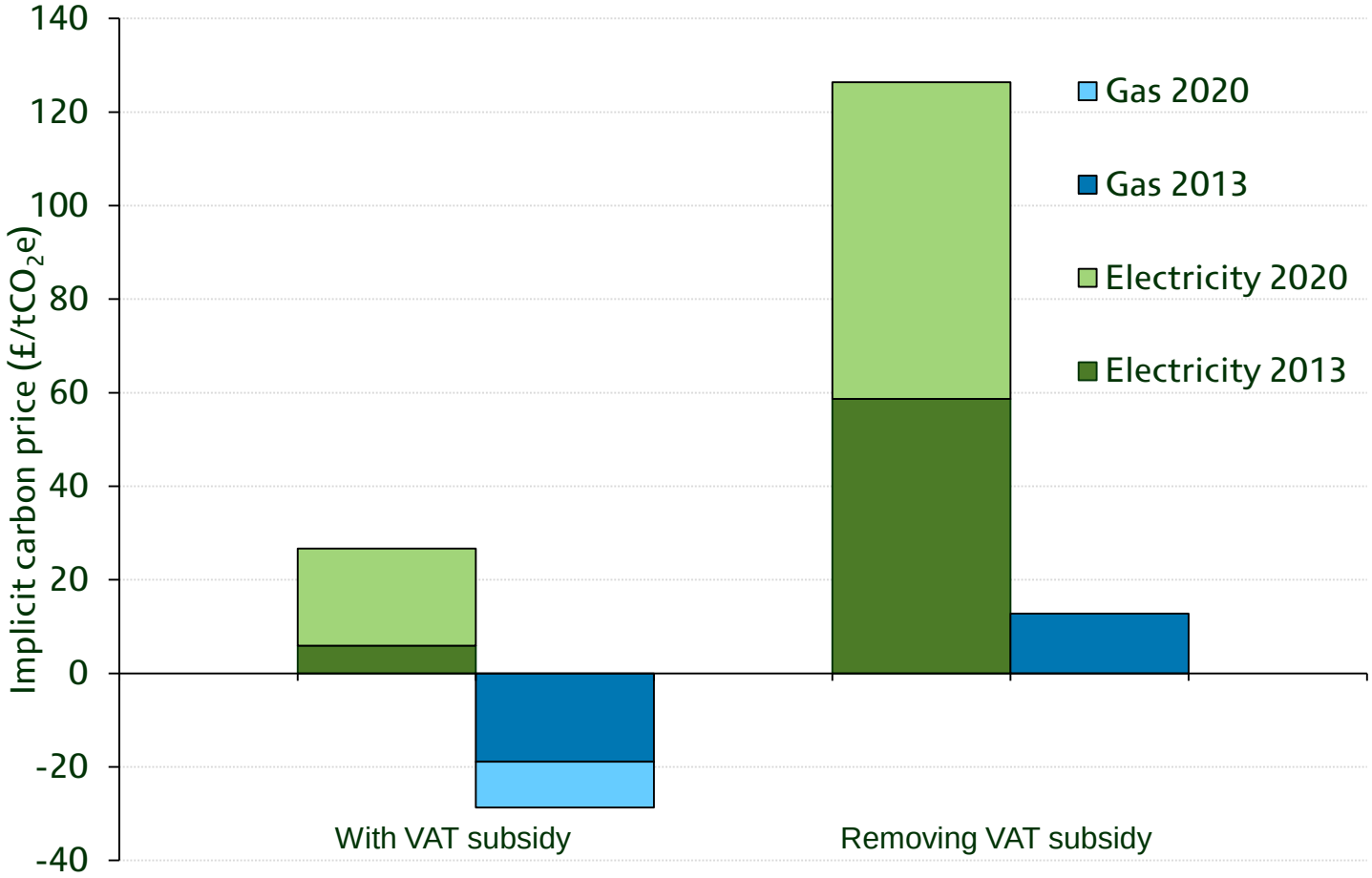
Interactions with announced future policy



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Interactions with announced future policy

- Many reasons to introduce a uniform rate of VAT.
  - VAT has undesirable properties as a form of carbon price subsidy (if one were wanted) since it depends on price not quantity.

- But if were to do this, would want to reduce extent to which other policies are funded through bills.
  - Impact on prices is therefore lower, in medium term, as policy would be raising prices even in absence of this reform.

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Distributional effects of harmonisation

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Average effects without compensation

- Gas tax adds 0.6% to average total expenditure.

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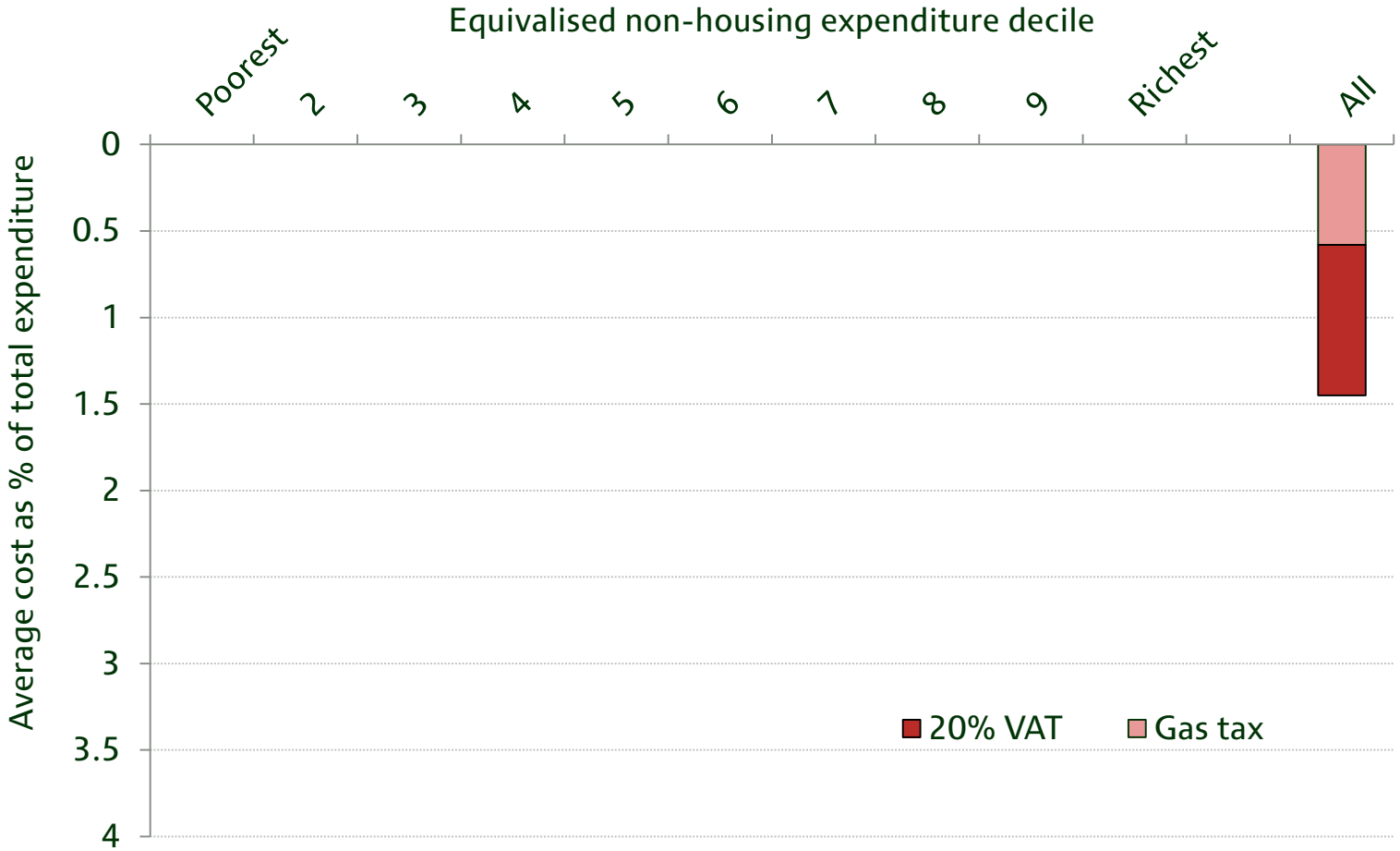
Average effects without compensation



- VAT adds an additional 0.9% to average total expenditure.

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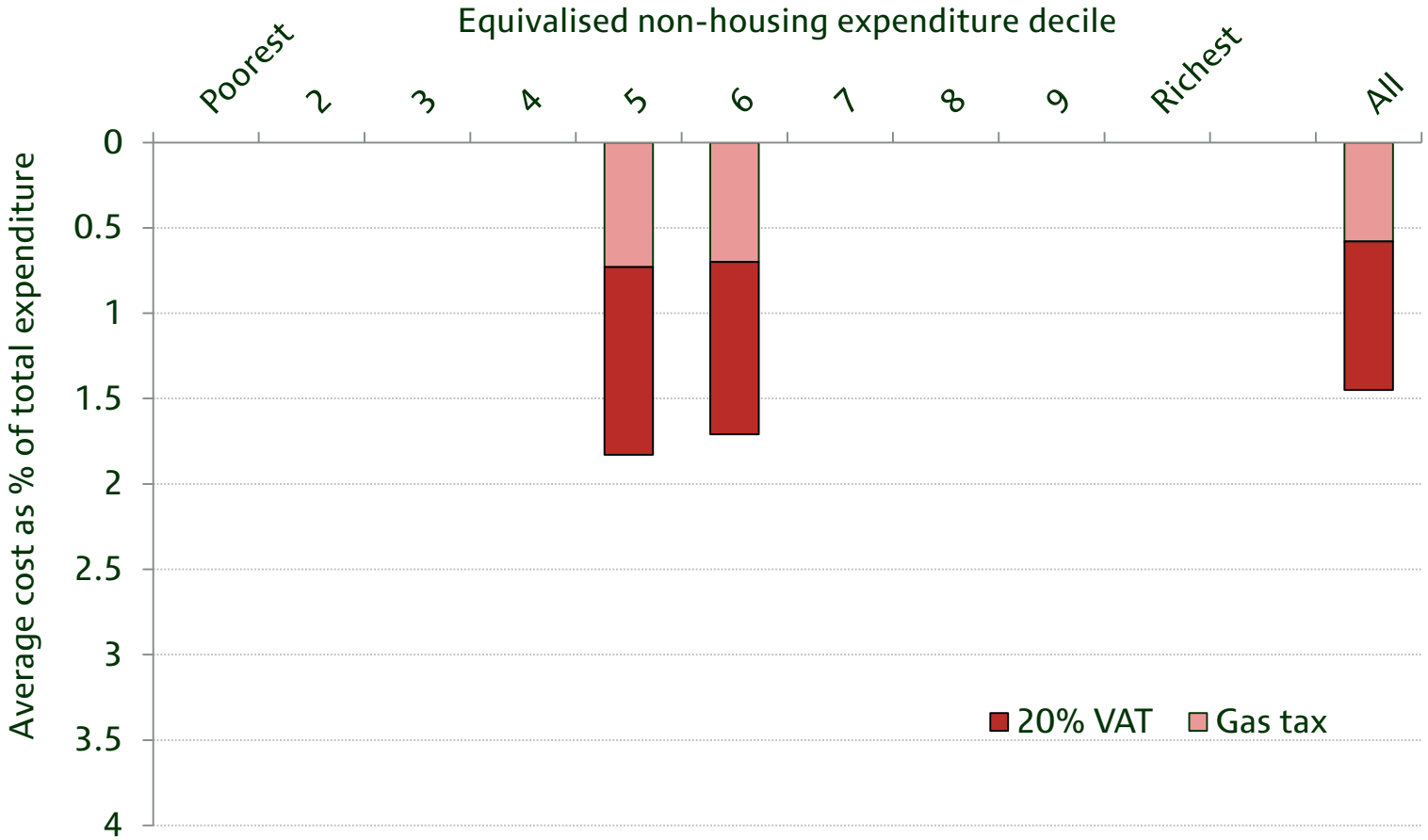
Distributional effects without compensation



- Combined reform adds around 1.8% to middle of distribution.

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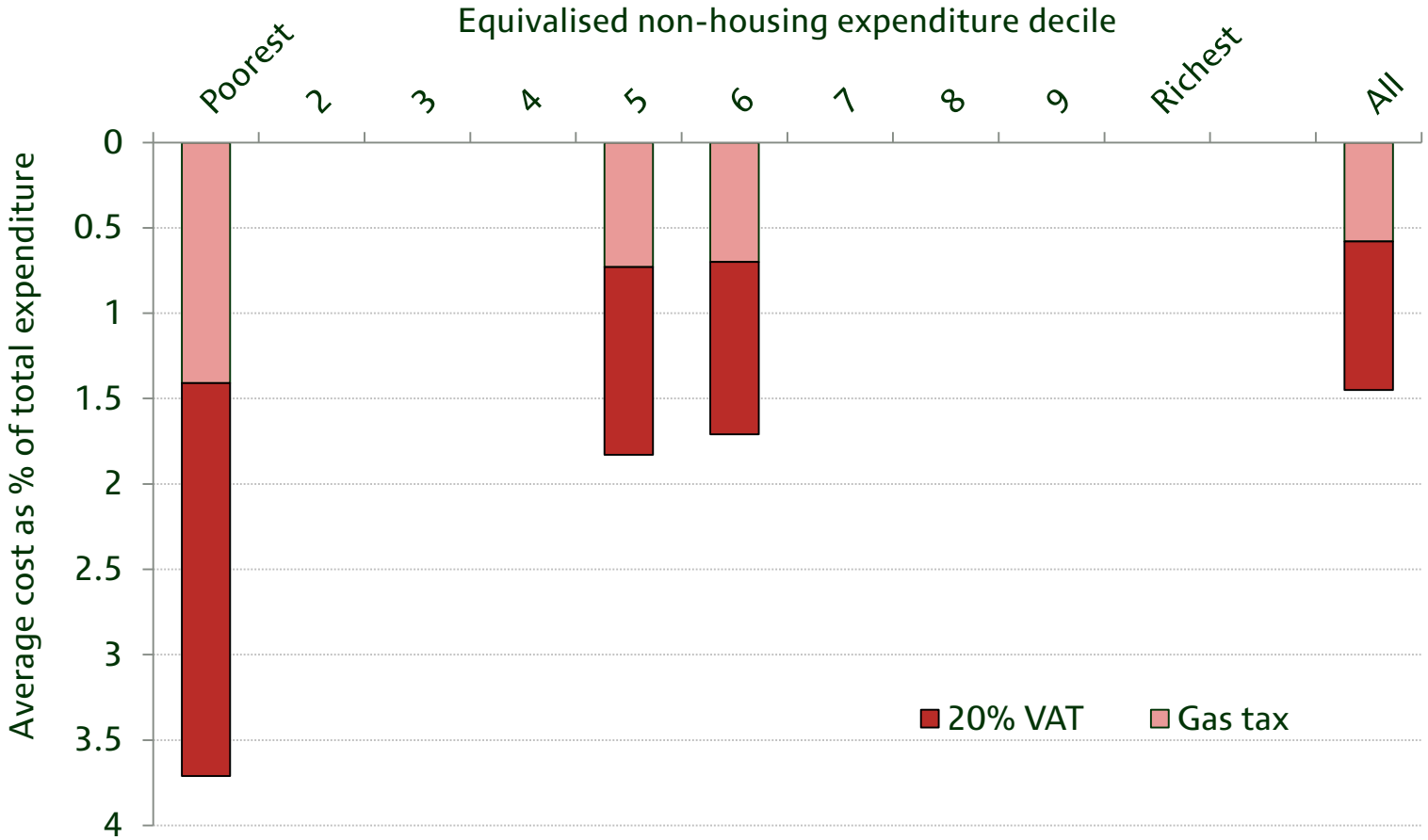
Distributional effects without compensation



- Combined reform adds around 3.7% to bottom 10% of households.
- Energy is large share of budget for these households.

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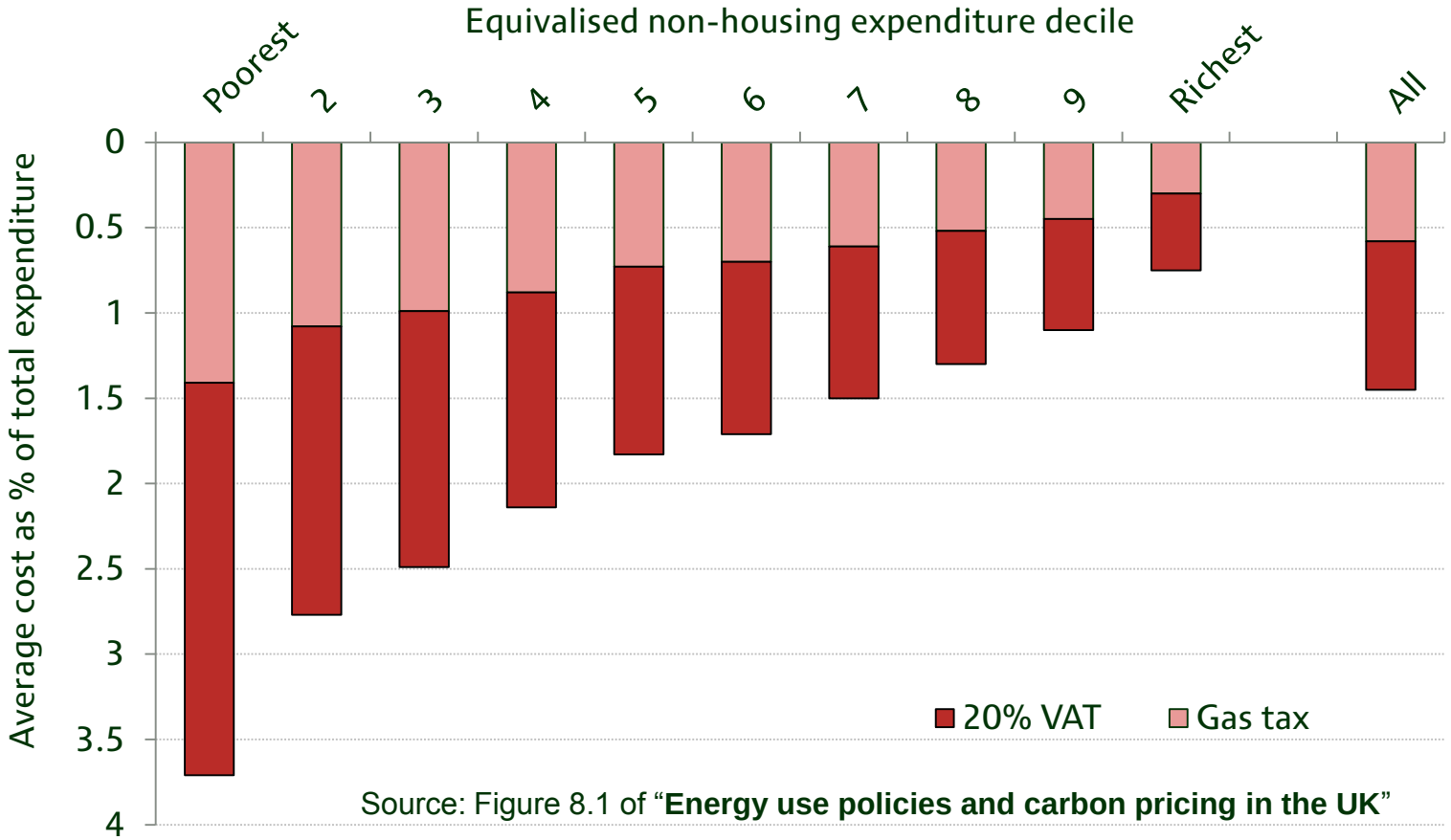
Distributional effects without compensation



Source: Figure 8.1 of "**Energy use policies and carbon pricing in the UK**"

- In absence of compensation, reform is 'regressive' in the sense that poorer households pay more as a share of expenditure.

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Potential compensation package

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Compensation for inflation

- These price increases therefore feed through noticeably to inflation (one-off effect).
  - CPI inflation rises by 1.2 percentage points.
- There is a degree of "automatic compensation" that comes from uprating of tax and benefit thresholds.
  - Estimated cost of this is £2.6 billion.
- Since energy makes up much larger share of budget for poorer households, even after this change they are most likely to be worse off.

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Additional compensation for poorer households

- We increase the size of some means-tested benefits, to provide compensation.
  - This reform is illustrative and broadly revenue neutral (spend £7.2 bn).
  - Many alternatives are available depending on distributional priorities.
  - We consider a strongly progressive option, to see how well one could compensate poorer households if that were the aim of policy.

- Groups targeted:
  - Poor pensioners.
  - Unemployed.
  - Low-income employed.
  - Individuals receiving disability benefits.

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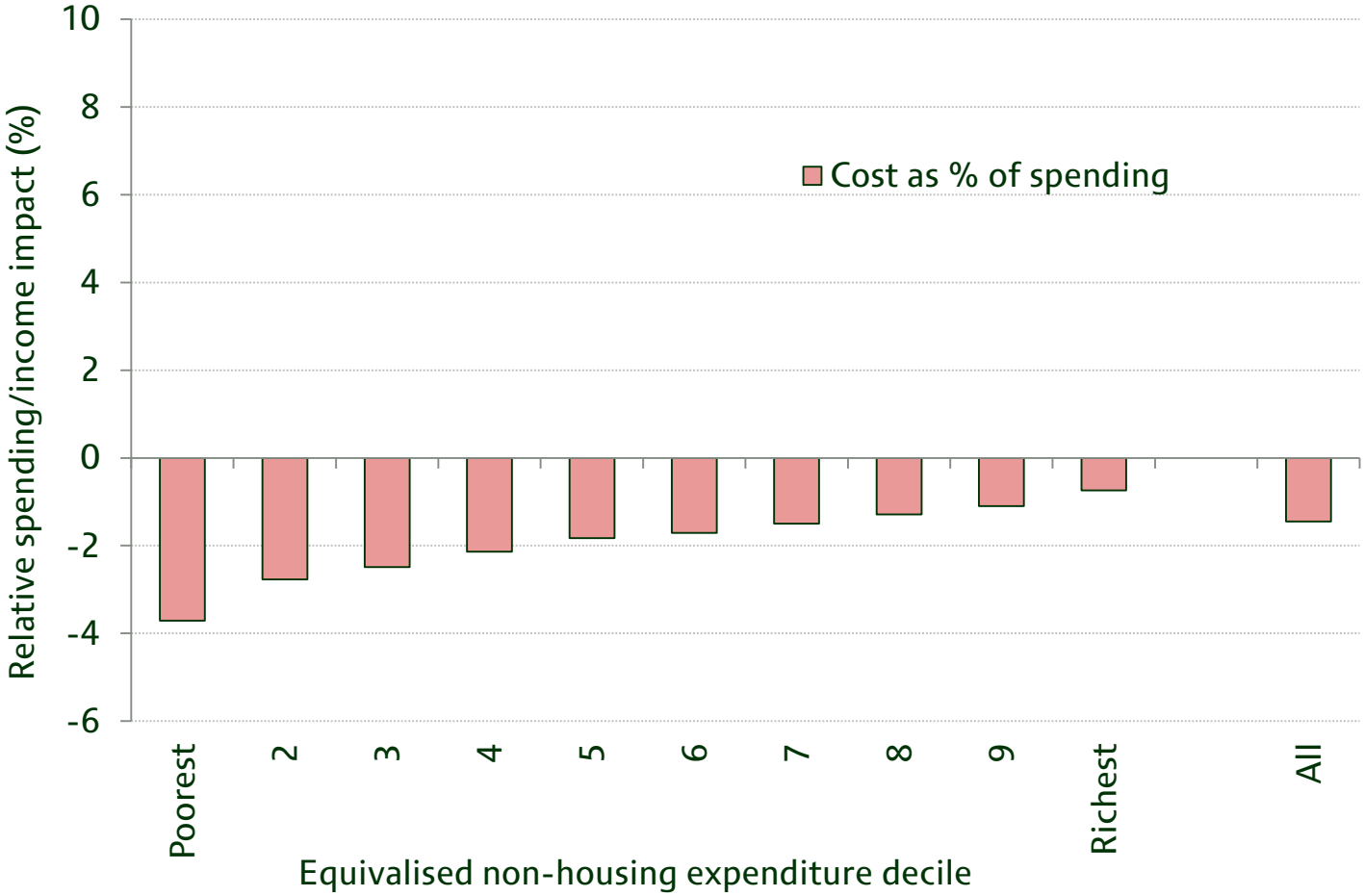
Average effect by decile



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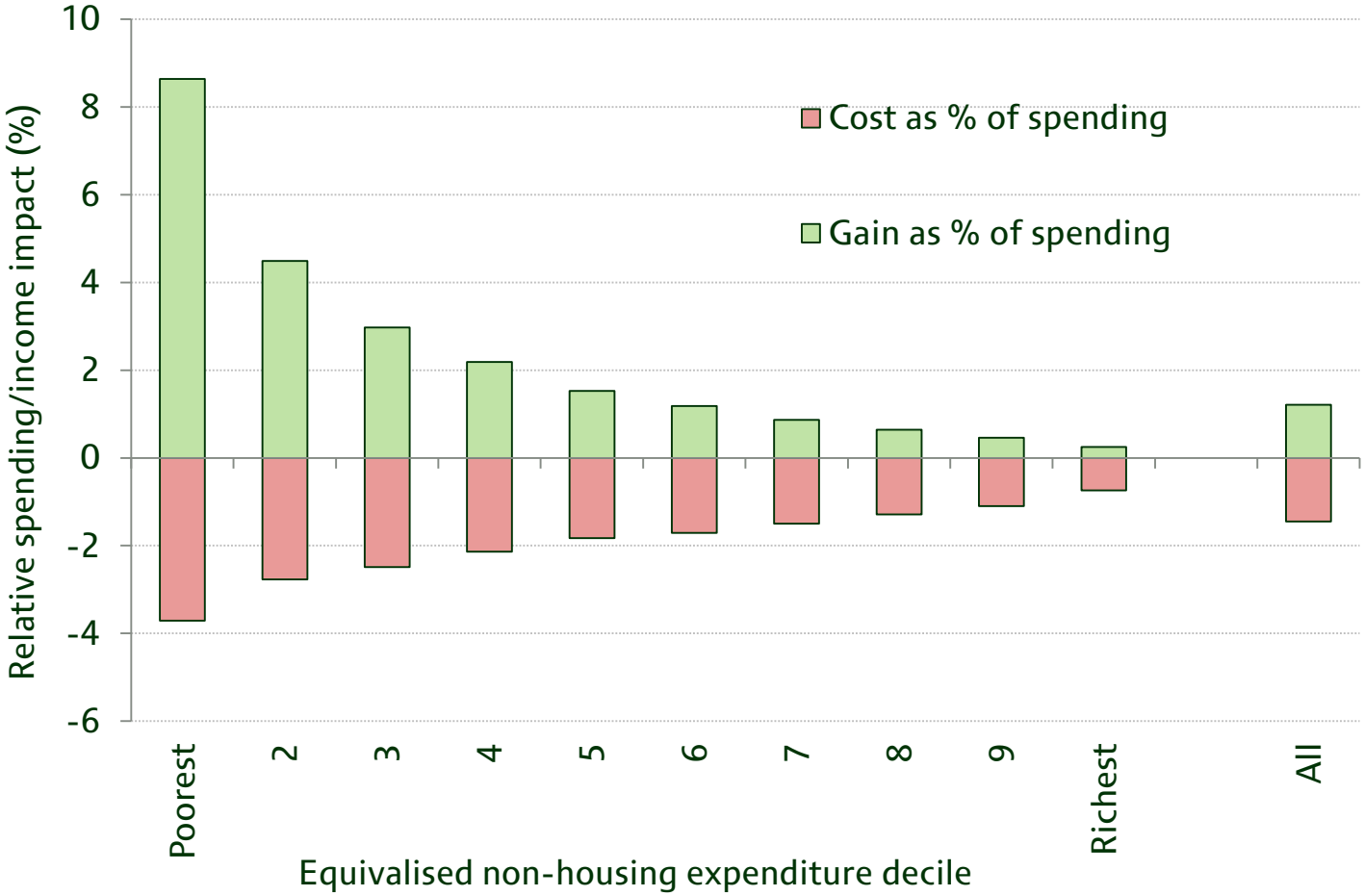
Average effect by decile



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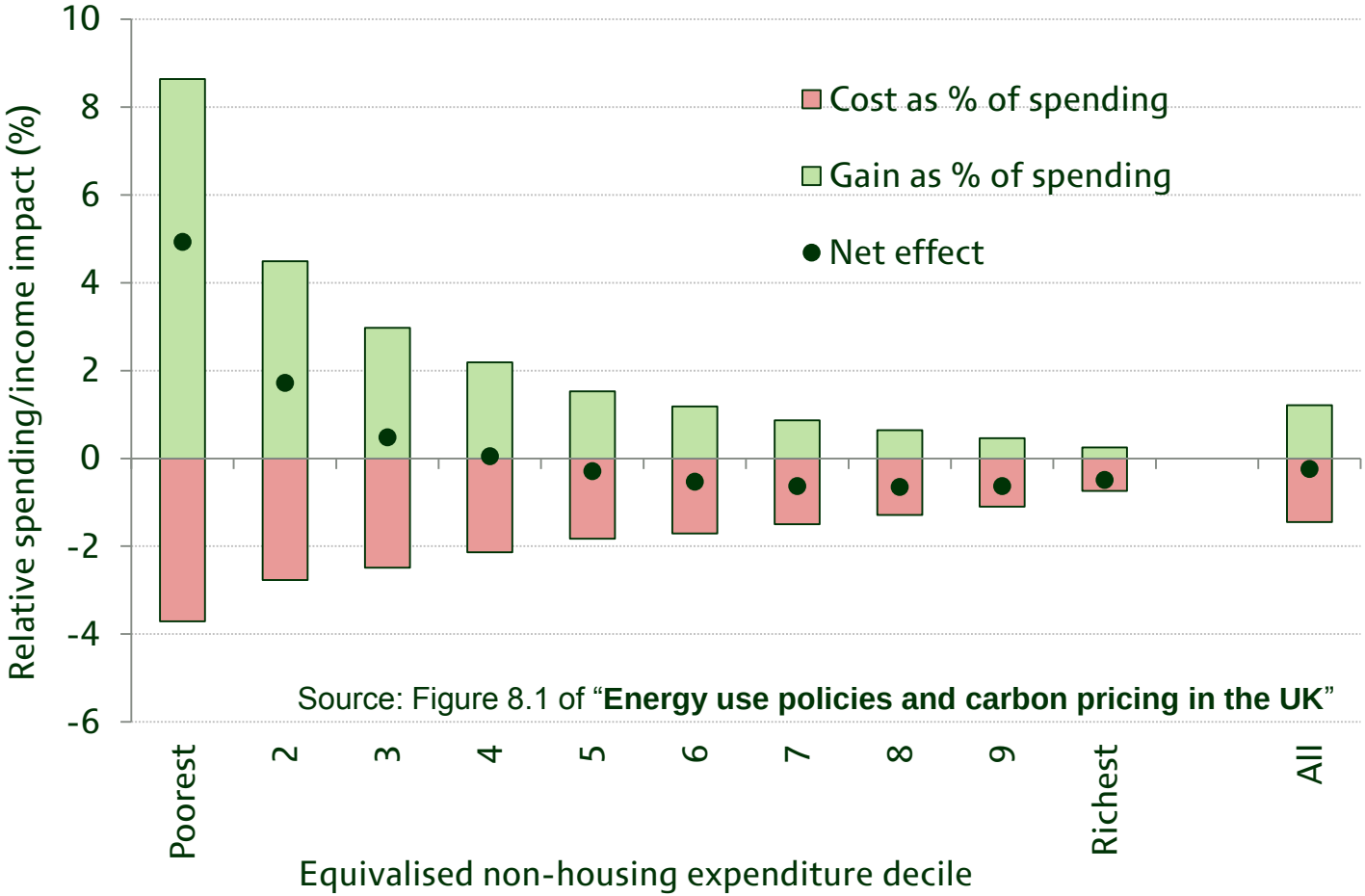
Average effect by decile



Source: Figure 8.1 of "**Energy use policies and carbon pricing in the UK**"

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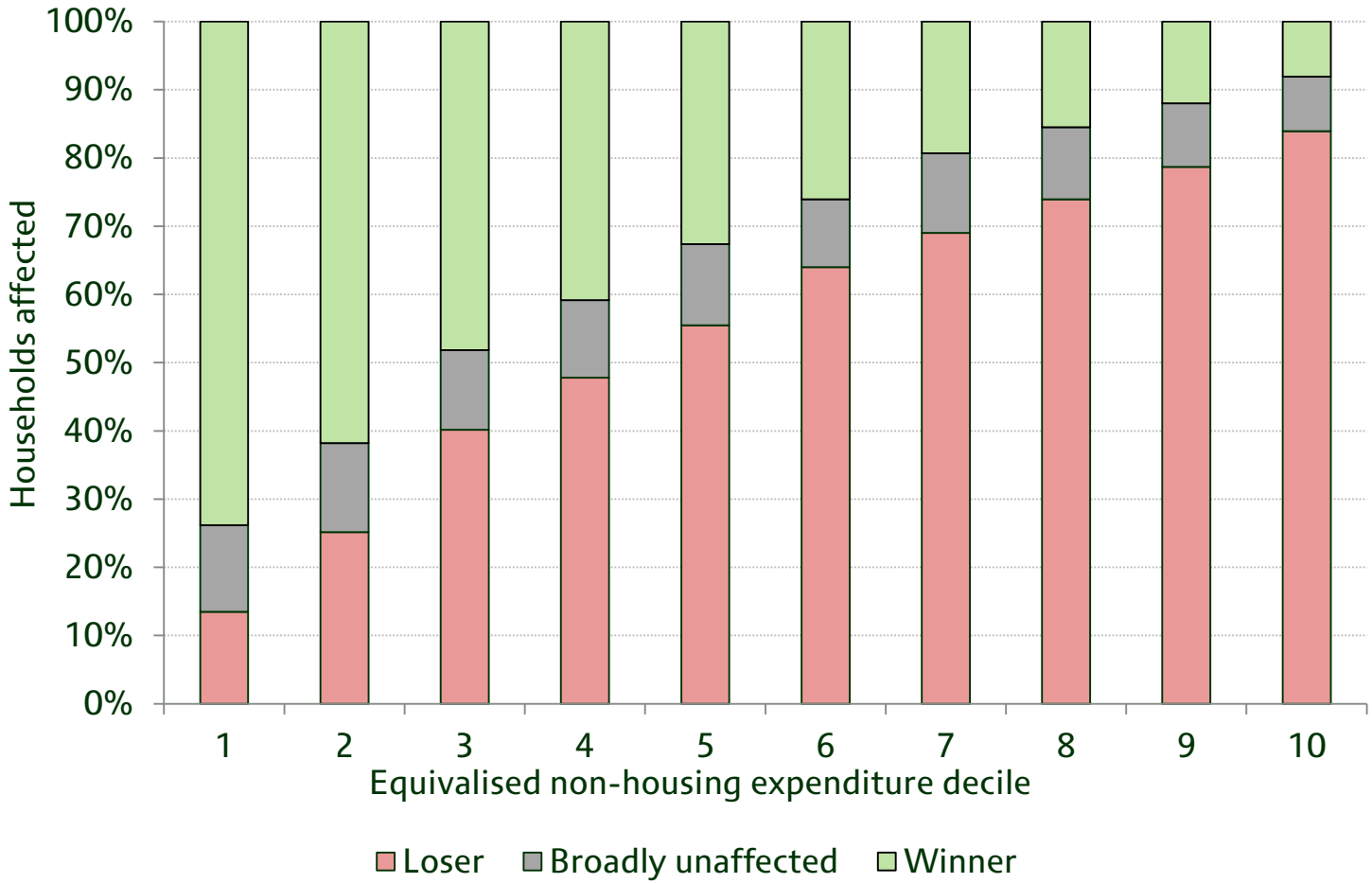
Within-decile variation



Source: Figure 8.2 of "**Energy use policies and carbon pricing in the UK**"

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Potential compensation - conclusions

- It is possible to harmonise household carbon prices whilst compensating poorer households *on average*.

- Within poor households there is significant variation.
  - Those who consume relatively large amounts of energy will still be worse off.

- Reform shown is illustrative.
  - Precise implementation depends on a government's distributional preferences.
  - We target poorer households particularly.
  - Also need to consider the interaction with work incentives.

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Reforms to other policies

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Preview

- Rationale for Feed-In Tariff and Renewable Heat Incentive is unclear.
  - Also consider whether bill levies are the best way to fund it.
- Make the Energy Company Obligation less prescriptive.
- Harmonise eligibility criteria for energy bill support.
  - Also improve information sharing where possible.

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Support for small-scale renewable generation

- Feed-in Tariff (FIT) and Renewable Heat Incentive (RHI):
  - Households or businesses install small amounts of electricity (FIT) or heat (RHI) generating capacity.
  - Paid a subsidy based on how much they generate (and for FIT also paid based on amount sold to the grid).

- They are expensive.
  - Spend about £0.5 billion per year on FITs.

- They are poor value for money.
  - Implied carbon price for FITs of £380/tCO_2e.
  - Not an efficient way to reduce emissions.

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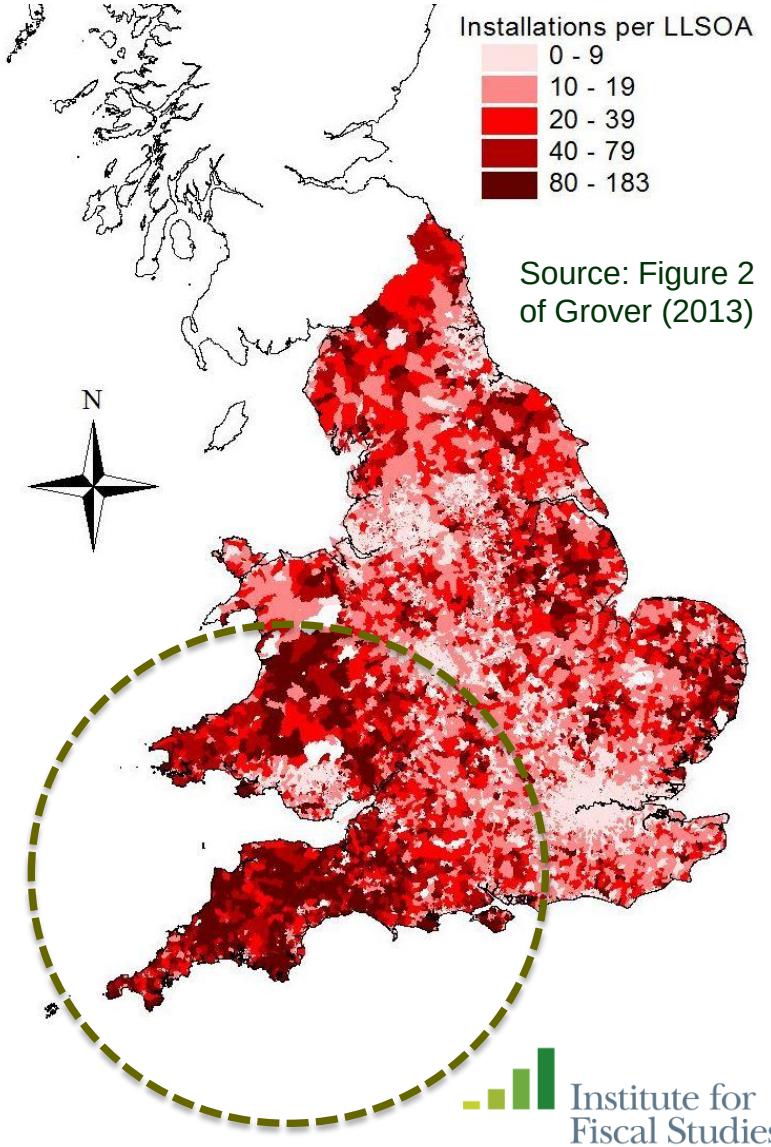
Location of FIT installations

- Installations are geographically concentrated in rural areas.
  - Particularly in SW England and Wales.



Source: Figure 2 of Grover (2013)

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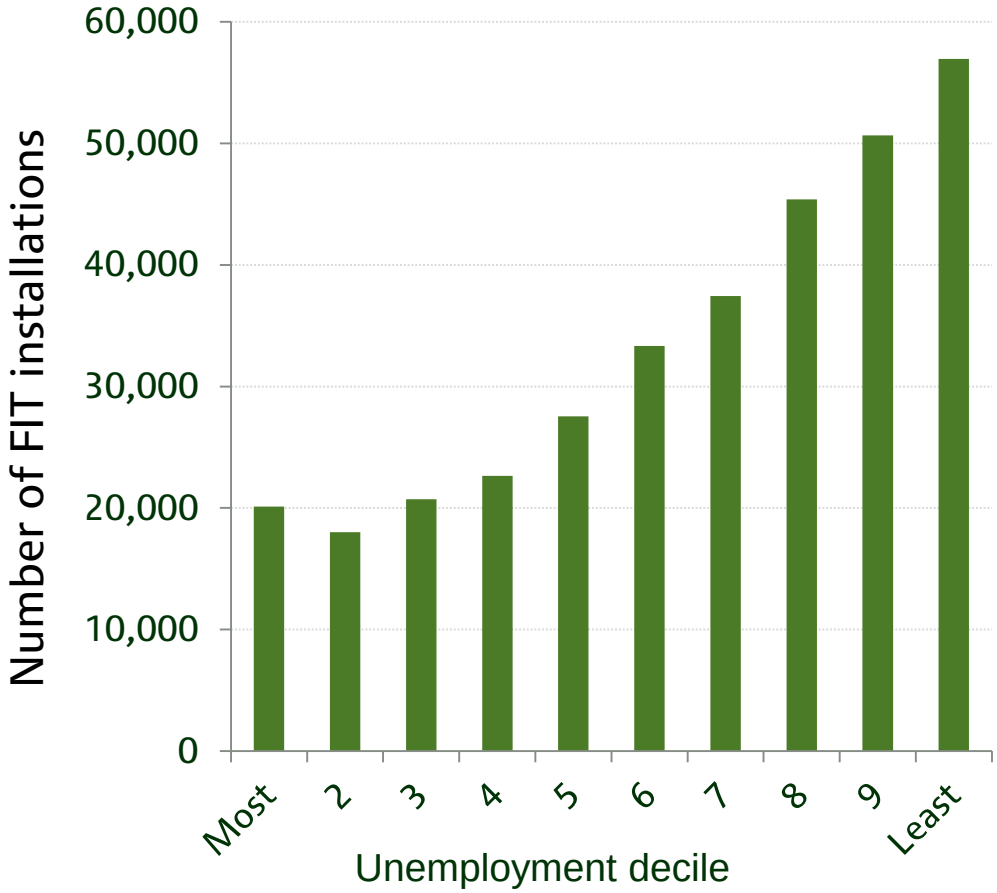
Who benefits?



Source: Figure 3 of Grover (2013)

- Benefits concentrated in relatively better-off areas.

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Support for small-scale renewable generation

- Feed-in Tariff (FIT) and Renewable Heat Incentive (RHI):
  - Expensive.
  - Poor value for money.
  - Concentrated in better off areas.

- Rationale for this policy is unclear.

- Also, in future FITs contribute to carbon price that is above target price.
  - If policy remains in place, case for funding through taxes rather than levies.

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Support for domestic energy efficiency

- Green Deal:
  - Offers loans to pay for home energy efficiency improvements.
  - Loans paid off through electricity bill.

- Energy Company Obligation (ECO):
  - Provides energy efficiency measures for free to poor households and those in hard-to-treat properties.
  - Three sub-policies, setting individual targets, some in cash terms, others in carbon terms.

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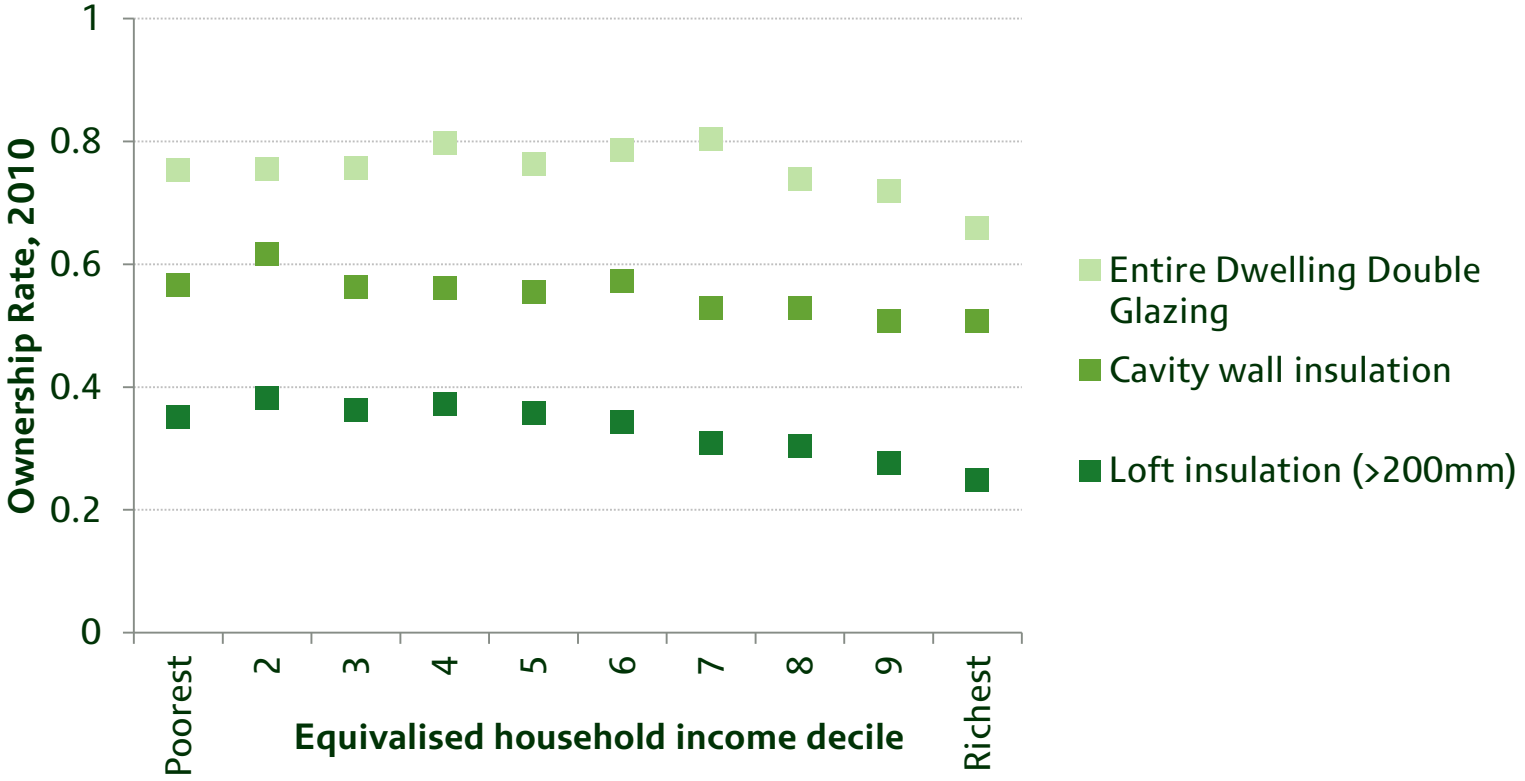
Support for domestic energy efficiency

- Energy efficiency take up doesn't vary significantly with income.
  - If anything richer households slightly less likely to have some measures.



Source: Figure 4.2 of Leicester and Stoye (2013)

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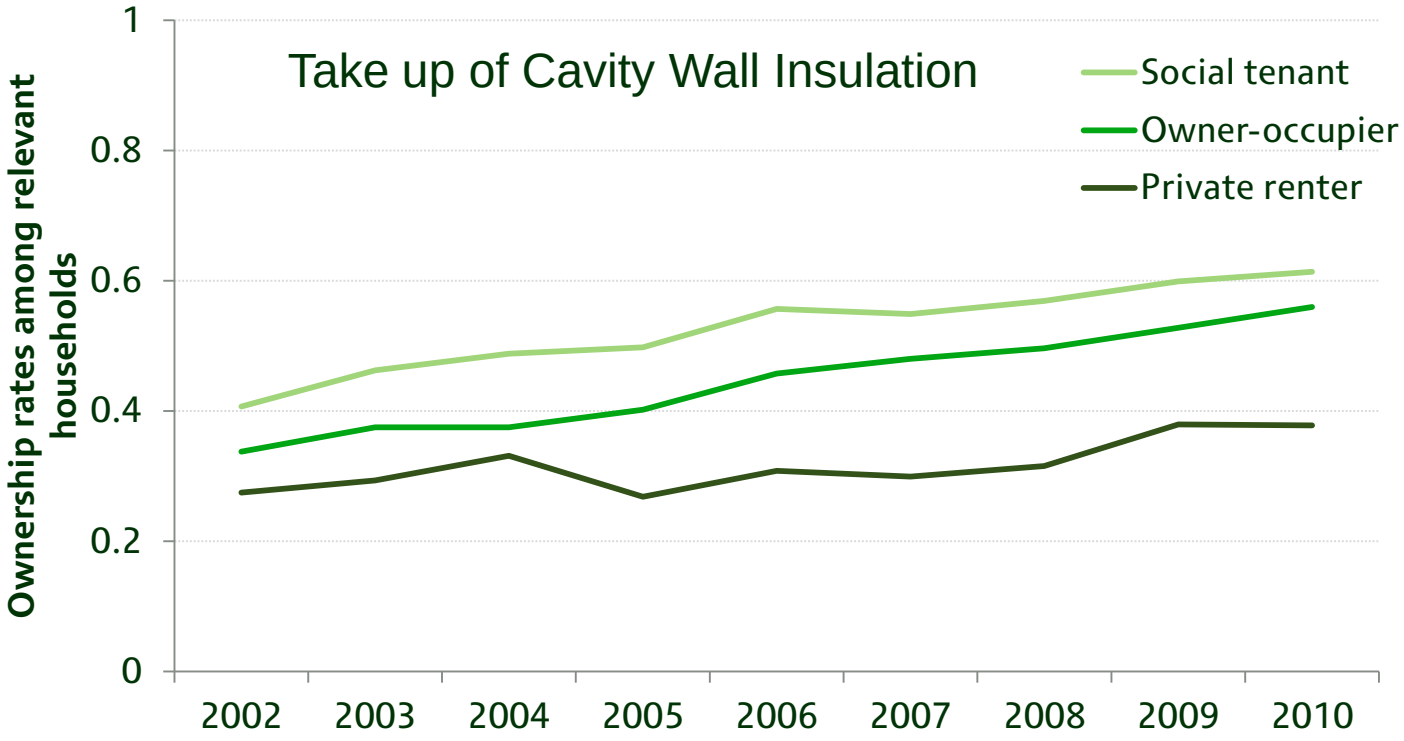
Support for domestic energy efficiency

- Tenure is important in take up of such measures.
  - Similar pattern for loft insulation and double glazing.



Source: Figure 4.1 of Leicester and Stoye (2013)

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Support for domestic energy efficiency

- Evidence that Green Deal does not target the key constraints.
  - Main barrier is not financial.
  - Tenure is an important constraint.

- Additional incentives provided e.g. cashback, reduce cost-saving compared with financing measures directly.

- Case for having more measures directly funded.

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Support for domestic energy efficiency

- Energy Company Obligation (ECO) provides direct funding for measures.

- But, it is unnecessarily prescriptive reducing efficiency.
  - Should just set carbon reduction targets.
  - May vary for different groups e.g. poorer households.

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Support for energy bills

- Warm Home Discount (WHD)
  - Electricity bill rebates to low income and vulnerable households.
  - £135 a year bill rebate to poor pensioners ("core group").
  - "Broader group" – defined individually by suppliers – may get rebate.

- Cold Weather Payment (CWP)
  - Payment to households who are poor and vulnerable.
  - £25 payment for each winter period of seven consecutive days below 0°C.

- Winter Fuel Payment (WFP)
  - Annual tax-free payments to households with individual above female state pension age.

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Support for energy bills

- Multiple policies with different eligibility criteria.
  - Eligibility criteria for WHD can even vary depending on which energy company a household is with.
- Take up could be improved if information sharing between DWP and energy companies is legislated for.
  - Information sharing already done for Pension Credit.
- Aim of WFP should be made clearer.
  - Costs £2.2 billion a year.
  - If the aim is to support bills for vulnerable households, the policy could be better targeted.
  - If the aim is to provide additional support for older households, there is a case for combining it with existing state pension provsion.

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Conclusion

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Conclusion

- Energy use policy is currently incoherent and inefficient.
  - This comes from having multiple conflicting objectives.
  - However, not clear we are tackling these in the best way.
- Have shown it is possible to introduce reforms which rationalise the price and compensate most of those with low incomes.
  - Whilst reforms can be progressive on average, can't ensure *every* low income household is compensated.
- This would reduce emissions substantially at no additional economic cost.
- Other policies also in need of reform.

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