

# DESIGNING CARBON TAXATION TO PROTECT LOW-INCOME HOUSEHOLDS

There are strong policy arguments for removing environmentally damaging (perverse) subsidies and for introducing carbon taxation to help reduce carbon emissions. This project has examined if it would be possible to design a revenue-neutral carbon tax on household energy use and transport, with a focus on safeguards to protect low-income households from negative impacts.

## Key points

- The taxation of household energy is particularly controversial because expenditure on energy is highly regressive (low-income households spend a higher proportion of their income on energy than richer households) and because of concerns about fuel poverty.
- Carbon pricing is widely recognised to be essential for the transition to a low-carbon society.
- Household energy and air travel are taxed at lower levels than most other activities; effectively a subsidy that has the environmentally perverse effect of increasing emissions.
- With appropriately-designed packages, a progressive approach to carbon taxation is possible with most low-income households gaining.
- Universal Credit and Pension Credit are effective at delivering compensation to low-income households. Almost no households receiving them would lose money overall.
- However, the compensation packages do not protect everyone on a low income as some are not eligible for benefits.
- If the Government wants to use taxation to reduce CO<sub>2</sub> emissions, it should not be dissuaded from doing so by fears of its impact on income, provided that at the same time it applies appropriate compensation measures.

## The research

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# BACKGROUND

There are strong policy arguments for removing environmentally damaging (perverse) subsidies and for introducing carbon taxation to incentivise efforts to reduce carbon emissions. However, the difficulty from the perspective of social justice is that green taxes, unlike income tax, do not directly relate to people's ability to pay. This project examines whether it is possible to achieve a progressive approach to carbon taxation – specifically whether it is possible to design a carbon tax on household energy use and transport and use the revenues generated to protect low-income households from the costs associated.

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## Modelling

The modelling looked forward to 2017/18 and took into account the effects of existing policies and, as far as possible, future planned policies. That date was chosen because 2017/18 is when Universal Credit will come fully into force.

The desire to price carbon in order to reduce carbon emissions led the Government in the 2011 Budget to introduce a carbon price floor (CPF) from 2013. The CPF will apply to the fossil fuel used in electricity generation, and will entail a carbon tax on these inputs, so that when this is added to the price of emissions permits under the EU Emissions Trading Scheme, there will be a minimum price for carbon emissions, starting at £16 per tonne in 2013 and rising linearly to £30 per tonne in 2020. This cost will be passed on to end users through their bills.

The project created two scenarios for modelling an increase of taxation on household energy. The first envisages the extension of the CPF to gas and non-metered heating fuels such as oil; the cost would be paid by the producer or importer and passed on to consumers, as happens already with other costs. The second scenario adds to this CPF extension an increase in the VAT rate on household energy from the reduced rate of 5 per cent to the standard rate of 20 per cent, which would eliminate what is now an environmentally perverse tax subsidy.

For each of these household energy scenarios, there was the further option to include an additional carbon tax at the same level as the CPF on transport fuels and on aviation emissions. The tax on transport fuels would be passed on to those buying fuel directly (and then through the price of tickets for buses, coaches and diesel trains, in the same way that the cost of fuel duty is already passed on). Because an international treaty prohibits imposing taxes directly on fuel for international aviation, the tax would instead be on aviation emissions, passed on to people buying airline tickets. There are four (2x2) scenarios in all:

- CPF on gas and non-metered fuels only ('small carbon tax without transport');
- CPF on gas and non-metered fuels, and VAT rate increase on household energy ('large carbon tax without transport');
- CPF on gas, non-metered fuels and transport ('small carbon tax with transport');
- CPF on gas, non-metered fuels and transport, and VAT rate increase on household energy ('large carbon tax with transport').

The measure would be revenue neutral. This would enable all the revenue to be recycled back to the public through an increase to the income tax allowance and higher benefits to support a progressive approach to the tax overall.

The team designed a series of compensation packages using the revenues from the taxes to address the impacts of the tax scenarios on low-income households. The compensation packages involve changes to Universal Credit, in particular, increasing the basic amounts of Universal Credit and lowering the rate at which it is withdrawn as incomes rise.

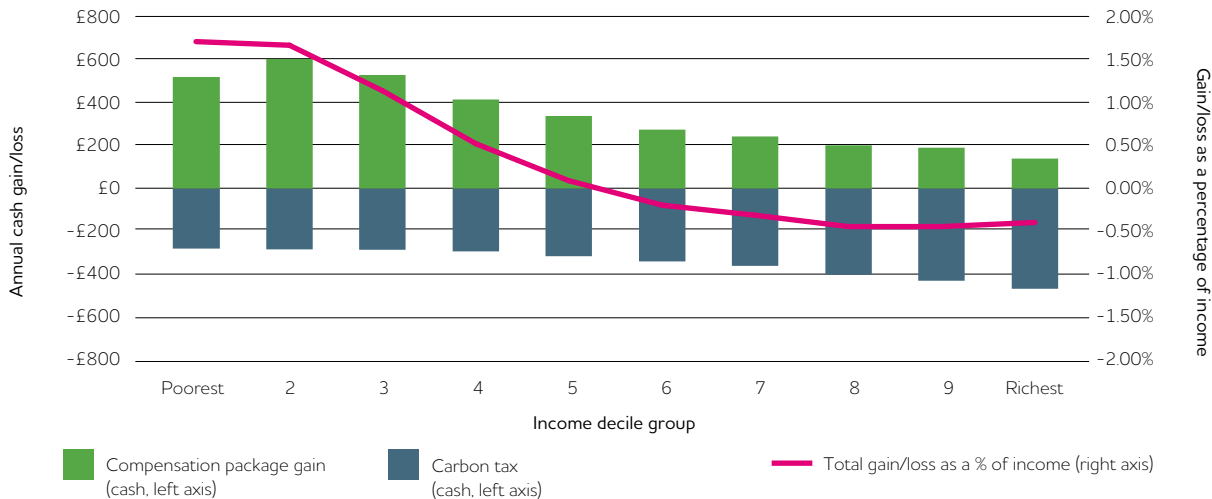
It is important to note that these taxes and their compensation packages are illustrative. A government that wanted to introduce a carbon tax would have its own income gain and loss objectives: the analysis here is simply intended to show that the introduction of a carbon tax need not disproportionately affect low-income households if the revenues from the carbon tax are used to fund an appropriate compensation package.

**Results**

Taxes on household energy would be regressive if applied alone, but there can be a progressive outcome if compensation is applied through Universal Credit and Pension Credit as well as the Income Tax allowances and the state pension. In order to provide enough help to minimise the number of people on low incomes who 'lose', the majority of low-income households end up gaining.

Figure 1 shows the distributional effects on income of the largest package as an illustration.

**Figure 1: Distributional impact on income of CPF on gas, non-metered fuels and transport and increased VAT on household energy (large carbon tax with transport) and associated compensation package**



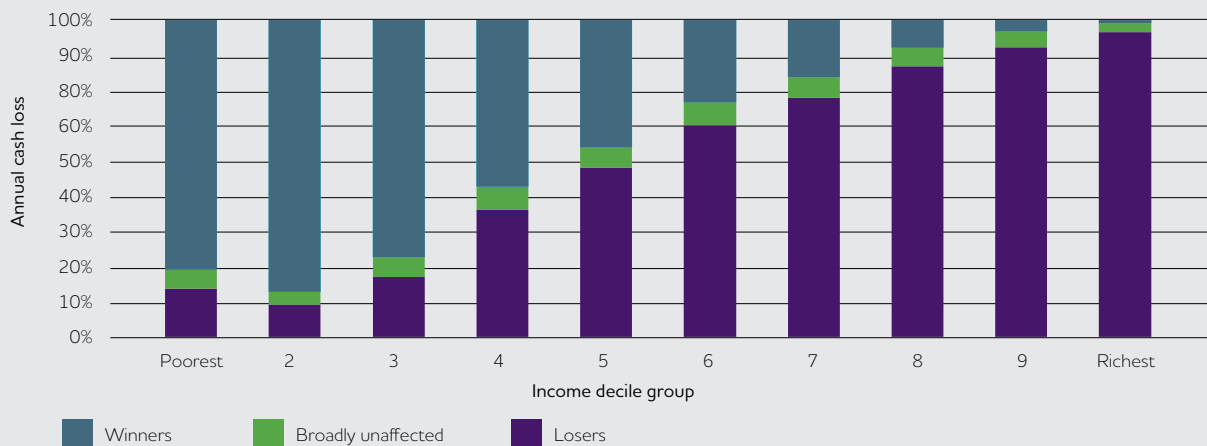
Note: Income decile groups are derived by dividing all households into 10 groups of equal size according to income adjusted for household size using the McClements equivalence scale. Decile group 1 contains the poorest tenth of the population, decile group 2 the second poorest, and so on up to decile group 10, which contains the richest tenth.  
 Source: Authors' calculations using the Distributional Impacts Model for Policy Scenario Analysis (DIMPSA) and the IFS's TAXBEN run on the 2004–2007 Expenditure and Food Surveys.

Figure 2 shows the proportion of each income decile group that gains or loses from the combined effects of the large carbon tax with transport and its associated compensation package. Following standard practice in analysis by the Institute of Fiscal Studies, a 'broadly unaffected' category is included for those households who gain or lose less than a pound per week (£52 per year) as a combined result of the carbon tax and compensation.

As the figure shows, most low-income households gain from these packages, and most high-income households lose. Despite this, however, the compensation packages do not mean there are no low-income households who lose, demonstrating how difficult it is to completely compensate all low-income households when a carbon tax is introduced.

The main reason for this is that there are some low-income households that will not be eligible for Universal Credit or Pension Credit. Almost all of those entitled to Universal Credit do not lose out overall from the introduction of the large carbon tax (with or without the transport tax). The

**Figure 2: Winners and losers by income decile from large carbon tax with transport and associated compensation package**



remaining low-income households that lose out are on the whole not entitled to benefits. In some cases this is because they have considerable savings or other assets, which mean they are not entitled to Universal Credit, perhaps suggesting that they have only a temporarily low income. In others, this is because they are students and hence are generally not entitled to benefits.

## Conclusion

The effect on income and distribution should not dissuade a government that wants to use taxation to reduce CO<sub>2</sub> emissions from doing so, provided that at the same time it applies appropriate compensation measures. This study shows that it is possible to protect the vast majority of low-income households (though not all), and almost all recipients of means-tested benefits, from the negative impact of a carbon tax through an appropriately-designed compensation package.

## About the study

This study has used the Centre for Sustainable Energy's (CSE) Distributional Impacts Model for Policy Scenario Analysis (DIMPSA) to model the energy consumption and expenditure of UK households, and the Institute for Fiscal Studies' (IFS) model TAXBEN to calculate the effect of changes in taxes, tax allowances and benefits.

## FOR FURTHER INFORMATION

This summary is part of JRF's research and development programme. The views are those of the authors and not necessarily those of the JRF.

The main report, **Designing carbon taxation to protect low-income households** by James Browne, Simon Dresner, Paul Ekins, Ian Hamilton, Ian Preston and Vicki White, is available as a free download at [www.jrf.org.uk](http://www.jrf.org.uk)

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