

# Discussion Paper | How to minimise the rebound effect

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In its broadest sense the rebound effect occurs when some pro-environmental activity results, directly or indirectly, in some environmental harm which partly or wholly cancels out the initial environmental benefit. For example, by installing a more efficient boiler, you will reduce your carbon emissions and heating costs, but you will spend the money you save on something else and that “something else” will have some associated emissions. Even if you save the money and put it in the bank, the bank will lend it to someone else who *will* spend it! It’s worth noting that rebound effects can occur for both domestic and non-domestic (business and public sector) pro-environmental activities.

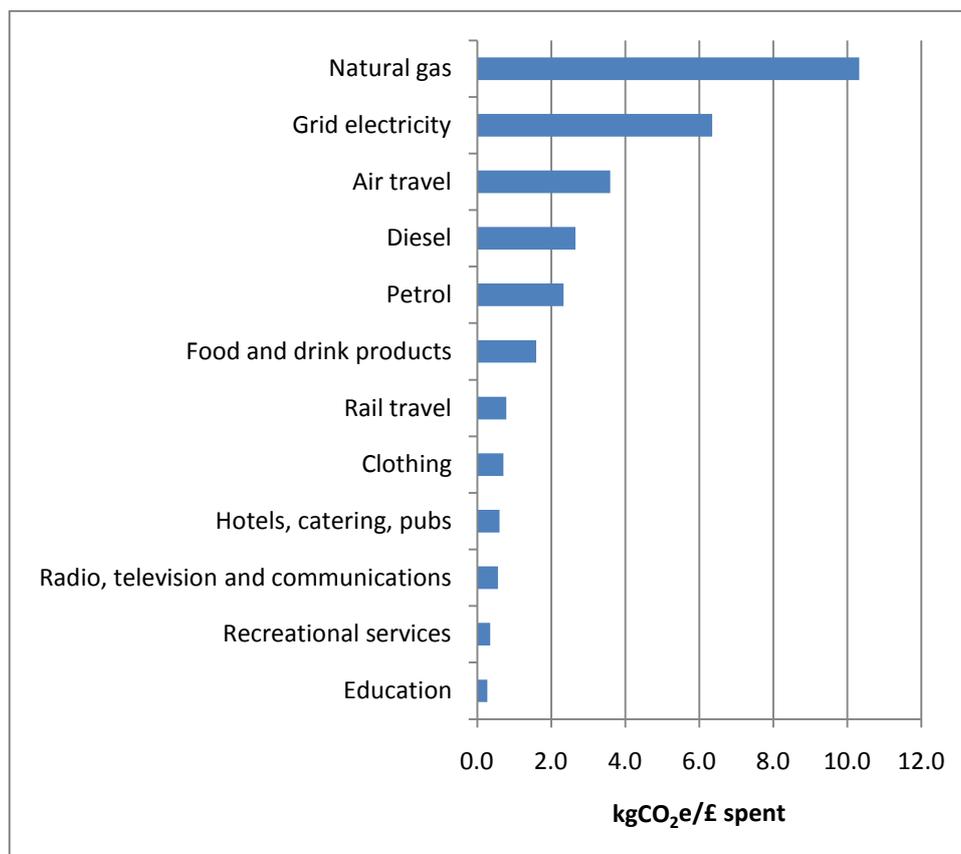
The rebound effect is of growing interest as a number of climate change mitigation policies promote energy efficiency in order to reduce emissions, e.g. the UK Government’s Carbon Emissions Reduction Target (CERT) and the CRC Energy Efficiency Scheme, and the effectiveness of these policies depends on how big the rebound effect is. Current research suggests that energy efficiency measures will still achieve net emission reductions, but that the rebound effect may reduce the savings by between 7% (Druckman *et al* 2011) and 26% (Cambridge Centre for Climate Change Mitigation Research 2006). For non-energy efficiency greenhouse gas abatement activities, such as replacing car journeys with cycling or reducing food waste, the rebound effect may be even higher (Druckman *et al* 2011). So we pose the question “What should we spend the saved money on to minimise the rebound effect?”.

Figure 1 shows the emissions per pound spent for a range of different goods and services. If we have a spare pound we can use this information to choose the lowest carbon place to spend it.

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Figure 1. Emissions per £ spent for a range of goods and services<sup>2</sup>



Gas and electricity create the most emissions per pound spent, because they are relatively cheap and highly carbon intensive. This means that switching from buying these to almost anything else, including flights and petrol, will reduce emissions.

At the other end of the spectrum are services like education and recreation, which have very low emissions per pound spent. So if we want to minimise the rebound effect we should spend our saved money on evening classes and 5-a-side football (and turn off the heating while we're out). The numbers in Figure 1 also tell us something about what the "low carbon economy" might look like, i.e. as a society we should be allocating more of our resources to education and recreation, and less to energy companies.

As with any simple analysis, there are always some limitations to bear in mind:

1. Some options may require expenditure on complimentary goods and services which aren't so low in emissions. For instance, recreation may be low-carbon itself, but it might be necessary to travel to the recreation site, and travel is relatively carbon intensive.

<sup>2</sup> The figures are from Annex 13 of Defra/DECC (2010), or are derived from DECC (2011), Defra/DECC (2010) and AA (2011).

2. There will be a limit to the amount of switching that can take place, e.g. there is a limit to how much education and recreation we want, and we will always need to buy some things which currently have relatively high emissions, such as food. So there is a need to reduce the carbon intensity of the goods and services we need, as well as switching from high-carbon sectors to low-carbon ones.
3. The values shown in the Figure 1 are based on economic input-output analysis which covers broad sectors of the economy, and within each sector there may be a range of carbon intensities. For instance, some recreation activities may be highly carbon intensive, such as drag racing – and there will be high and low carbon choices within each sector as well as between them.

One final thing to consider is that rebound effects can actually be positive as well as negative, i.e. some pro-environmental actions are relatively expensive, such as renewable energy or organic food, and their consumption takes money away from other things, thereby creating an additional reduction in emissions.

## References

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