Climate change targets must reflect the impacts of our consumption

University of Leeds – Policy Brief

Emissions embodied in net trade continue to grow in the UK

The UK reports Greenhouse Gas Emissions from a territorial basis, including all the emissions that occur within the territory of the UK. However, the UK is one of the largest net importers of emissions embodied in trade in the world. While emissions continue to decline (albeit at a relatively slow rate) within the UK, the emissions associated with the imports of products consumed by the UK continues to rise. These emissions are not included in the UK 2050 carbon target to reduce 1990 level emissions by 80%. The UK's boasts of cutting carbon emissions are illusory because the carbon embedded in imports outweighs the savings at home. UK territorial emissions have reduced by 194 Mt in 2012 compared to 1990. Net emissions embodied in trade added an additional 280 Mt in 2012.

Net traded emissions have now doubled in the past 20 years, while emissions within the UK have reduced by 26%. Over the same period, consumption-based emissions have reduced by 7% and before the recession in 2008 emissions had increased by 25%.

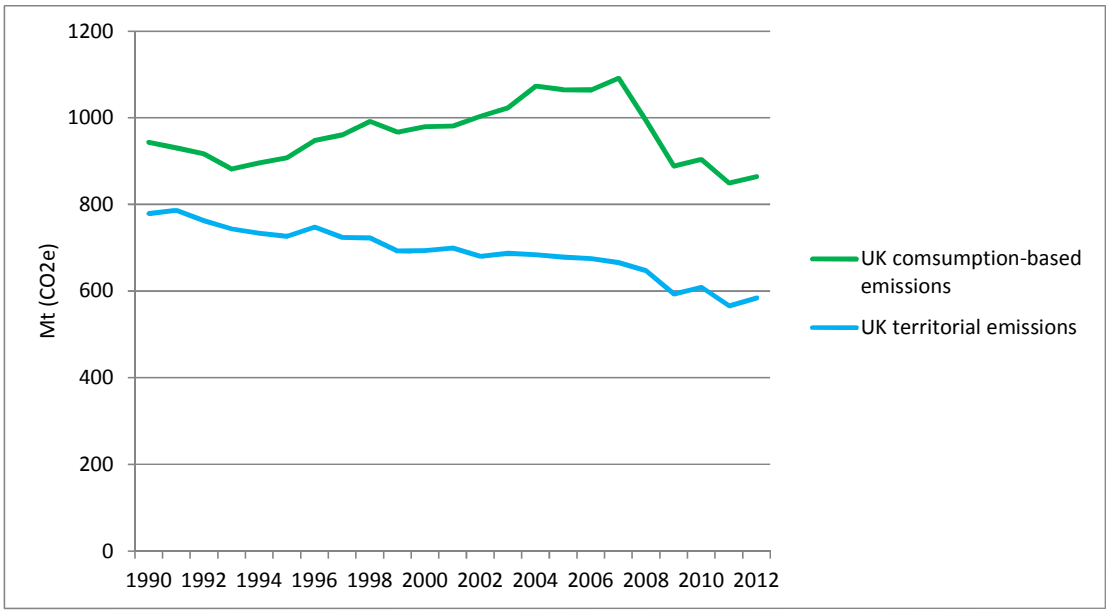

Figure 1: UK GHG emissions inventories 1990-2012

The emissions included under the 2050 target have reduced while aviation, shipping and emissions embodied in net trade, which are excluded from the target, have increased. With increasing global trade, emissions accounting and setting targets from a territorial perspective doesn't counteract the adverse impacts globally driven by a nation's consumption.

The UK will continue to be a net importer of embodied emissions even with deep cuts globally

Here we present a scenario, based on future projections from the International Energy Agency, which was undertaken with the Committee on Climate Change. It considers what the UK's territorial and consumption based emissions could be by 2050. The scenario informs us what would happen to the UK if there were deep cuts in global emissions in line with the Intergovernmental Panel on Climate Change carbon budget to limit global temperature increases by two degrees. It is hoped that a deal at the climate negotiations in Paris will establish the foundations to move towards this goal.

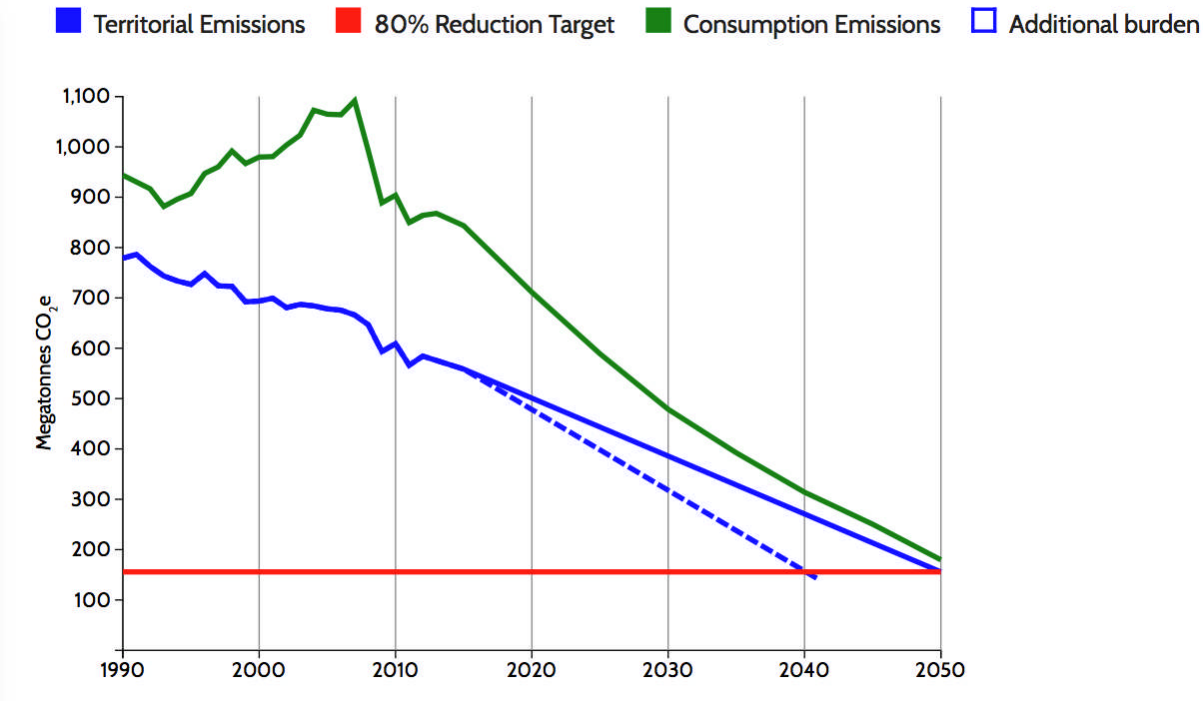

Figure 2: Emissions in the future under deep global cuts

Even with deep cuts in global emissions, the UK would remain a net importer of global emissions in line with trends in imports. If the UK was to take responsibility for these additional emissions, then the target would have to change. At present, the UK has a legally binding commitment to reduce territorial emissions by 80% by 2050 based on 1990 levels. With the additional emissions included, the UK would need to achieve an 80% cut ten years earlier (80% reduction by 2040).

In addition, it is not just the end target that is important but the trajectory towards the end goal. The scale of climate change relates to the total cumulative emissions in the atmosphere and carbon emissions released today will be in the atmosphere for 100 years. Instead of emission reductions of 2% a year, the UK would need to reduce emissions at a rate of 3.5%. Without the tightening of the target and an increase in the rate of annual reductions, the UK will not achieve the intended climate outcome associated with the existing target. The future must clearly be vastly different from the past.

The Committee on Climate Change must review the UK's carbon commitment to ensure that it aligns with the Intergovernmental Panel on Climate Change's suggested carbon budgets to avoid dangerous climate change

Assigning the net emissions embodied in trade to the UK is just one way to consider the UK's responsibility to achieving the global goal of limiting global temperature rise to two degrees. The current UK target to reduce emissions by 80% is based on the contraction of global cumulative emissions to have a 50% probability of limiting temperature rise to 2 degrees and less than 1% probability of reaching four degrees, and an assumed UK allowance equivalent to equal global per capita emissions in 2050. However, the target indirectly implies that other countries in the world have a smaller proportion of the remaining carbon budget based on the size of their population in 2015. Figure 3 gives some insights into what the carbon budget could be for the UK under a different set of assumptions on how to distribute the remaining global carbon budget.

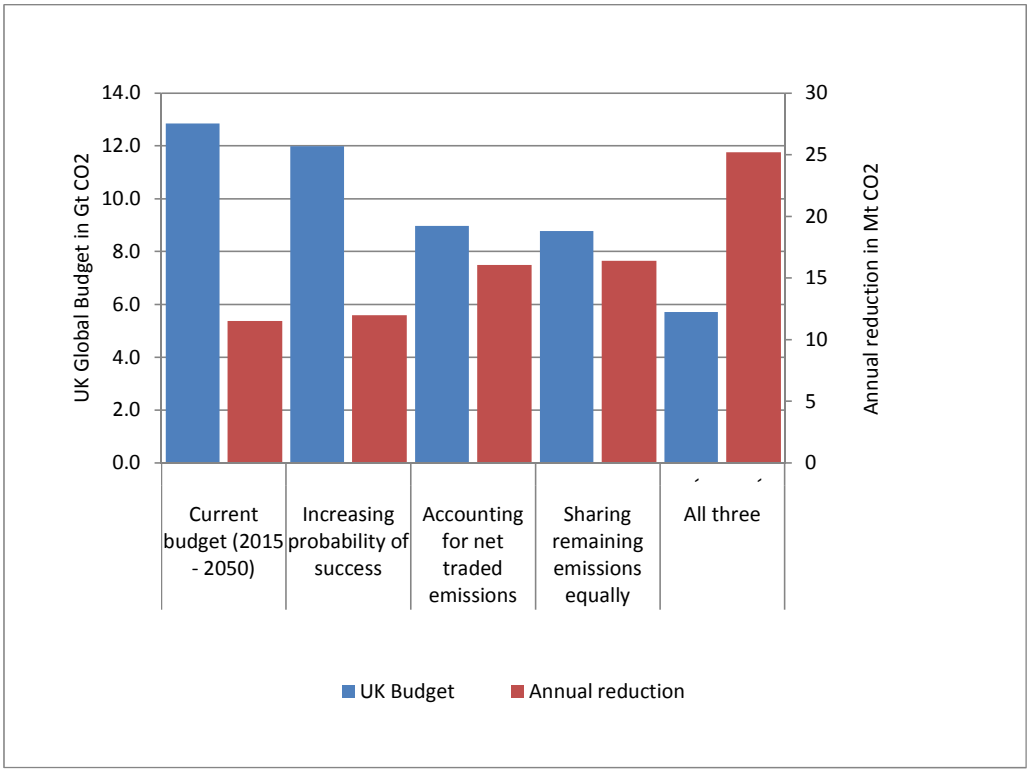

Figure 3: Allocation of the global carbon budget to the UK

The current target of 80% in the UK implies a budget of 13 Gt from 2015 to 2050 based on a linear annual reduction. If the UK were to assume a probability of 60% as opposed to the current 50% for achieving the two degree target, then the overall budget would reduce by 1 Gt, meaning the 80% target would need to be brought forward a year. As previously discussed, accounting for the net traded emissions would bring forward the target to 2040. Finally, if the remaining global carbon budget was shared evenly based on today's population the UK's target would also be brought forward to 2040. If all three assumptions were adopted, then the UK would need to achieve its carbon target by 2031 and double the annual rate of emission reduction. The UK has already set establish carbon budgets up to 2027 and these budgets are not in line with the assumptions shown in figure 3. To achieve the same climate outcome, deeper and faster cuts would need to be made after 2027. It is generally understood, that deeper and faster cuts have greater costs.

The UK needs a comprehensive strategy to reduce energy demand

One of the greatest challenges facing energy and climate change policy is the speed and scale of change needed to avoid exceeding cumulative emissions budgets. Policy must be established in the next parliament that results in significant emissions reductions in the short term and sets in motion activities to enable on-going reductions in the medium to long-term.

The most significant opportunities to reduce emissions are to reduce demand for energy and decarbonise the supply of that energy. These factors are not independent; if less is achieved through reducing demand for energy; energy supply will have to decarbonise further and faster. The recent IPCC report demonstrated clearly that the greater the demand, the greater the cost of mitigation (IPCC, WG3 SPM).

Energy security becomes an increasing threat as more energy imports are required. Furthermore, many of the technologies we rely on to decarbonise the energy system (such as CCS) are still many years from deployment, which poses a risk to the achievement of reductions in the short-term. The UK Government must focus more on demand management to ensure cost effective and timely reductions in emissions. With this in mind, we propose the UK Government establishes a **Primary Energy Demand Reduction Target.**

At present, the Department for Energy and Climate Change has strategies and policies to improve the energy efficiency of homes, transport, industry and businesses. However, these strategies are focused on micro energy efficiency policies (e.g. cavity wall insulation) rather than overall demand reduction (a reduction in the total inputs to the system). Energy efficiency in isolation does not deliver energy demand reduction due to rebound effects, continual economic growth, population increase, and structural change. Evidence shows that the UK has barely reduced its energy demand for the past 20 years, despite widespread micro energy efficiency policies. From a consumption perspective, in 1990, the primary energy demand of the UK economy was 11.5 EJ and in 2011 it was 11.0 EJ (contact author for more details). This has happened in part by exporting energy consumption, in the form of embodied energy within goods and services.

One of the reasons for the poor progress on demand reduction is the fact that the drivers of energy demand are affected by policy in departments with no responsibility for energy or climate change. For example, decisions on road buildings, constructing HS2 and spatial planning decisions will affect the demand for energy from transport; planning policy and building codes will affect demand from residential buildings; economic policies on VAT rates, interest rates, banking reserves all affect energy demand from industry and households.

DECC has little control over these decisions but is faced with the consequences of having to accelerate decarbonisation of supply. The current lack of co-ordination could be addressed, and action on demand accelerated, if a cross-government target for primary energy demand reduction was enforced alongside the current target for emissions reductions.

Further Information

For data and visualisations, academic papers and other relevant reports, please visit the website:

www.emissions.leeds.ac.uk