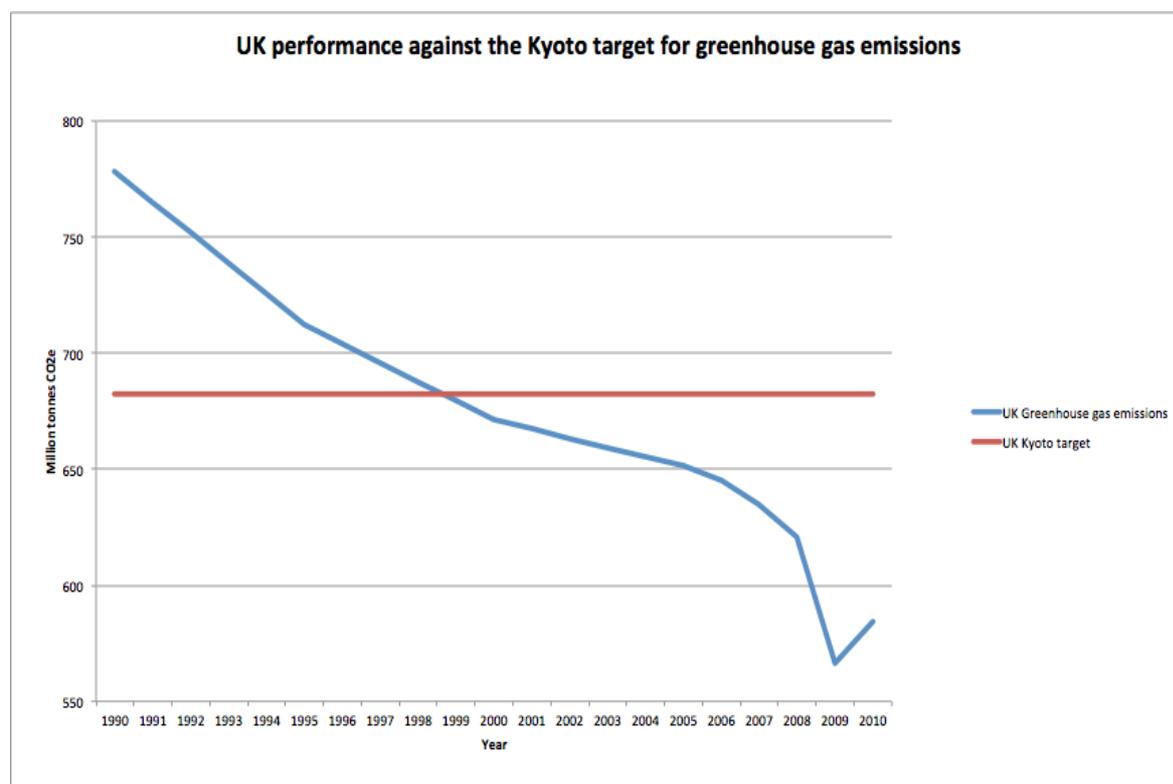


Ministers shouldn't boast about Kyoto; the UK's greenhouse gas emissions have risen.

But surely the UK is well on course to meet its Kyoto target?

Environment Ministers from around the world are gathering in Rio for the Earth Summit. They will share platitudes and congratulate each other for shifting the debate about climate change into one about green growth. They will no doubt be competing with each other to compare decreases in carbon dioxide emissions. But in the counting of carbon much of what matters is in the detail. This paper assesses the UK's carbon record and finds that it is not what it seems.

Ed Davey, Secretary of State for Energy and Climate Change, will be trotting out the UK's familiar line. We, the UK, almost uniquely, have more than met our Kyoto targets for greenhouse gas emissions. It's up to other countries, above all rapidly industrialising China, to rein in theirs. And the UK's case will appear in the press with a graph that looks something like this:¹



The Kyoto Protocol requires that greenhouse gas emissions are reduced by 12.5 per cent below base year levels over the 2008-12 period. The base year was as long ago as 1990, so what the UK agreed to do was to reduce its greenhouse gas emissions by over a tenth in about twenty years. In practice this means average emissions of 682 million tonnes CO₂e a year over 2008-12, and as the graph shows, the UK is well on course to be below this level.

The UK's case is both technically correct and deeply misleading. There are two major reasons for that, both related to the way emissions are counted for the purposes of the Kyoto protocol:

- air transport and shipping are not included at all in the Kyoto figures; and
- the Kyoto targets cover emissions that take place in the country concerned, not emissions that take place elsewhere and which are imported into the UK embodied in other products, even though these emissions are caused by our lifestyle.

When these factors are included, the story of UK emissions since 1990 is very different.

This is not a new idea, but it insufficiently recognised. Green House Chair Rupert Read made exactly this point in his evidence to Parliament's Energy and Climate Change Committee in 2011.ⁱⁱ Green House economist Molly Scott Cato also emphasised the point in her evidence to the Environmental Audit Committee in November 2011.ⁱⁱⁱ

Air transport and shipping

Emissions from air travel and shipping have together doubled since 1990, from 3.2% of total UK emissions (measured on the Kyoto basis) to 7.7%.^{iv} These are simply omitted from the Kyoto Treaty and the figures. No doubt the technical reason for that omission was that the fundamental basis of measurement was emissions from within national territories, and emissions in international airspace and the high seas could not be attributed to any one nation. But it surely did not escape the Kyoto negotiators that these emissions, especially from air travel, were rising very fast. It is a bit like a chocoholic going on a calorie controlled diet and deciding not to include chocolate.

Moreover the figures the UK does publish for aviation and shipping are computed on a very conservative basis for two reasons

- the figures only include emissions from ships and aircraft leaving the UK, that is about half the total of those both leaving and arriving. Clearly it would be wrong to include both those leaving and arriving, as then there would be double counting in the international figures. But especially in the case of aviation, far more than 50% of the passengers are in fact UK citizens; we are generating more than 50% of air traffic leaving from and arriving here.
- It is well established that aviation emissions are especially damaging because they take place high in the earth's atmosphere and arguable that they should be counted at two or three times their nominal values. Yet the UK figures make no correction for this.

Other smaller differences

There are other smaller differences between the Kyoto figures and the figure the Government publishes in the Environmental Accounts, whose total value is quite substantial and which also have grown rapidly. In fact they have more than doubled since 1990, and now amount to nearly 5% of emissions (on the Kyoto basis).^v The biggest item is cross boundary emissions, which is travel by UK people in foreign countries less travel by foreigners in the UK; a lot of both is tourism. Other differences arise from different treatment of Crown Dependencies and Overseas territories and of certain land use changes.

Greenhouse gases embodied in imports

However the main problem with the Kyoto figures is that they are compiled on the basis of activities that take place within the UK, and accordingly take no account of emissions embodied in things that we import. Surely the proper basis for comparison should be what the consumers in each country cause to happen. Of course, if that is to be the basis, for the figures to be consistent as between countries, emissions embodied in exports need to be subtracted, while emissions embodied in imports should be added.

There have been a number of attempts to estimate the greenhouse gases embodied in imports less those embodied in exports. It is by no means simple, and unsurprisingly the results have varied widely. We consider here one of the largest such estimates, that by Dieter Helm and his colleagues in 2007,^{vi} and also the most conservative, and on the face of it the most thorough estimate, by the Stockholm Environmental Institute in 2008 on behalf of the then DEFRA.^{vii}

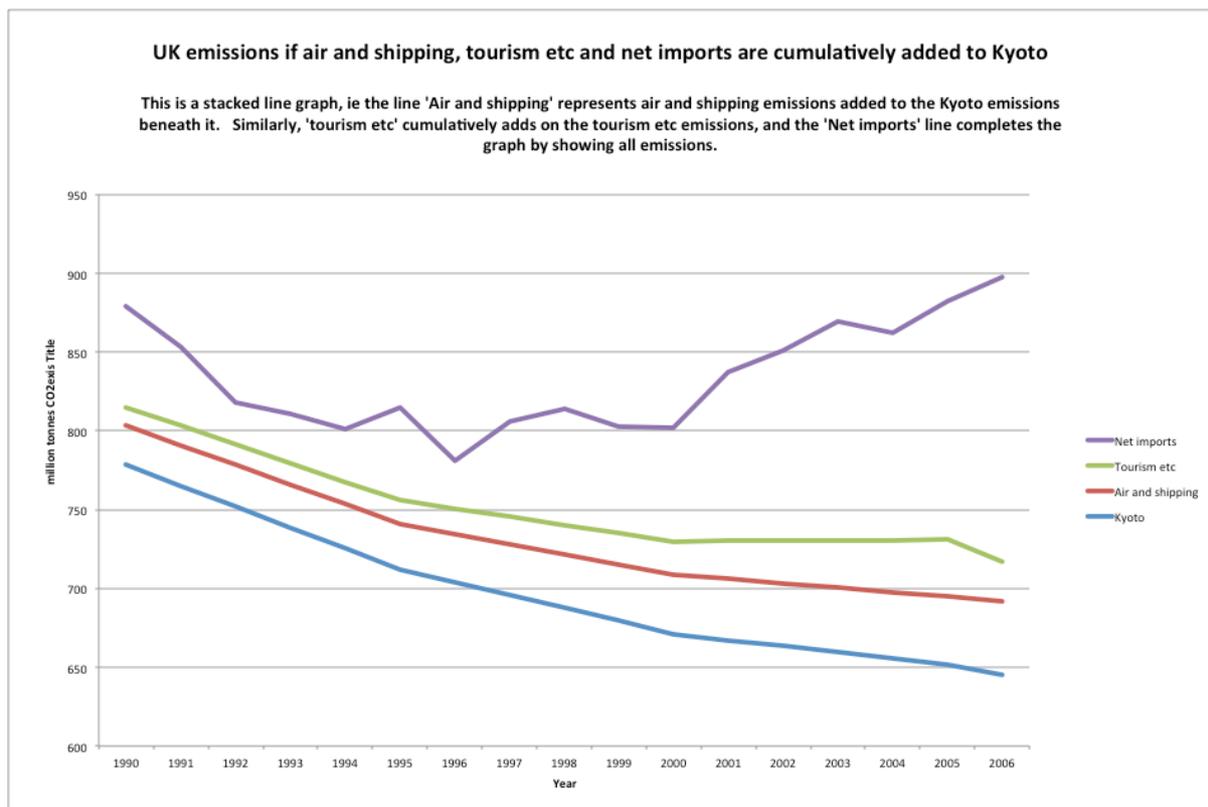
Dieter Helm's method was pretty simple. For any country you can work out the average quantity of greenhouse gases emitted per unit of production. If you look at how many imports come from a given country, you can work out a rough idea of the greenhouse gases associated with them. Conversely, for UK exports you can work out a rough idea of the total embodied in exports. Then you can work out the gases embodied in imports less those embodied in exports. This calculation showed emissions embodied in imports less those in exports rising from 110 million tonnes CO₂e in 1992 to 620 million tonnes CO₂e in 2006.^{viii} 620 million tonnes CO₂e is almost as much as the *total* Kyoto emissions for the UK in 2006, that is 682 million tonnes CO₂e. If imports less exports are contributing on this scale the overall total would have increased by almost 50% by 2006 as compared to 1990, not decreased.

But of course this is very crude. It ignores the fact that different kinds of exports and imports produce very different amounts of greenhouse gases, and that the make up of our imports is very different from our exports. Thus the calculation needs to be done on a product by product as well as country by country basis. The Stockholm Institute have undertaken a much more sophisticated calculation that takes these factors into account, and produces considerably lower figures for greenhouse gases associated with net imports to the UK. Overall they see emissions associated with imports less those associated with exports rising from 26.8 million tonnes CO₂e in 1992 to 131.8 million tonnes CO₂e in 2004.^{ix}

Who is right? The Stockholm Institute report includes the results from a number of other studies, and most of these estimates are nearer their end of the argument than Helm's. The Stockholm figures are used here, but a couple of extensions are made because of their rather restricted range of dates. First, they don't calculate figures for 1990 and 1991, and the 1990 figure is needed to establish a baseline for the Kyoto target of a 12.5% reduction over 20 years. To estimate these figures, one would expect some short term correlation between net emissions and the *value* of net imports, and using this one can estimate values for 1990 and 1991. Second, the trend over time of Helm's figures are very similar to those of the Stockholm study. The figures rise by 15% and 19% respectively in the last two years of Helm's analysis, and we can apply these rises to extend the Stockholm data over two further years, 2005 and 2006. These extrapolations are used in the graph below.

Putting it all together

If we include all these factors – that is add to the Kyoto reported emissions figures for air and sea transport, for tourism and a number of smaller items, and most importantly the figures for net imports – we arrive at the following rather different graph of the UK performance since 1990:



While the dash for gas – the substitution of gas for coal in electricity generation in the 1990s – did reduce emissions over that decade, our continuing economic growth, and in particular the growth of our consumption of energy intensive manufactured imports has meant that overall since 1990 our emissions have slightly increased, and not declined as our politicians would have us believe. The substitution of emissions in imports for the decline in emissions associated with goods manufactured here as manufacturing has declined has led to an increasing level of emissions since about 1998. While there might have been some reduction with the slowing of the economy since 2007, it is instructive to compare our performance against a target in line with the spirit of Kyoto. A 12.5% reduction in emissions since 1990 against this expanded basket of greenhouse gases would result in a target of 769 million tonnes CO₂e; we have been above that level throughout the period.

What should our government do?

The reporting requirements under Kyoto are a regrettable fact enshrined in an international treaty, and the government is of course obliged to continue reporting on that basis. But the Government should build on the basis already partially contained in its own Environmental Accounts. It should:

- Voluntarily count aviation emissions and use these as a basis for introducing a tax on aviation fuel and increasing passenger duty;
- Voluntarily include sea transport emissions in our totals;
- Include an estimate of the emissions embodied in both imports and exports, and consider how far more energy efficient domestic manufacture of many imported items might reduce our overall greenhouse gas impact; and
- Push for this to become standard across the EU, setting a global example.

References

ⁱ Figures from 2011 Environmental Accounts, Table 2.5, line K8BX, and using linear interpolation for the years not separately reported in the Environmental Accounts.

ⁱⁱ <http://rupertsread.blogspot.co.uk/2011/12/embodied-emissions-my-evidence-to.html>. As detailed in his evidence to Parliament, Read has been ploughing this furrow for years, consistently dogging Ministers who have been claiming that Britain's emissions have fallen since 1990.

ⁱⁱⁱ See <http://www.greenhousethinktank.org/page.php?pageid=responses>.

^{iv} Environmental Accounts, 2011, Table 2.5, line K9BP and author's calculation.

^v Environmental Accounts, 2011, Table 2.5. I'm referring here to the aggregate of line K9BO less line K8BX and less line K9BP.

^{vi} Helm, Dieter, Smale, Robin and Phillips, Jonathan, *Too Good To Be True? The UK's Climate Change Record, 2007*, available at http://www.dieterhelm.co.uk/sites/default/files/Carbon_record_2007.pdf.

^{vii} Wiedmann, T.; Wood, R.; Lenzen, M.; Minx, J.; Guan, D.; Barrett, J. Development of an Embedded Carbon Emissions Indicator - Producing a Time Series of Input-Output Tables and Embedded Carbon Dioxide Emissions for the UK by Using a MRIO Data Optimisation System, Stockholm Environment Institute, 2008, available at <http://www.sei-international.org/publications?pid=831>.

^{viii} Helm, 2007, pg 20.

^{ix} Stockholm, 2008, pg 21, Table 2.