

Peer Review of the Proposed Revised Approach to Carbon Valuation

Paul Watkiss¹ April, 2009.

I have undertaken a rapid review of the paper. While I understand and accept the logic for moving to a MAC based approach, I have reservations about the specific method and values proposed. The key points are outlined below.

On the overall approach

The move to marginal abatement costs, and to a framework of cost-effectiveness, is a reasonable and pragmatic choice. We now have defined policy targets for the short- and long-term, which were not set on the basis of the social cost of carbon (SCC), and thus there is a high risk of under- or over-delivery of these targets if Government continues to use a SCC value. However, while this solves one set of problems (the uncertainty of SCC values, and the potential for a policy gap), it creates another set, notably around the use of a single or multiple values, the uncertainty of marginal abatement costs, and the inconsistent policy coverage and legislation across different sectors.

I found that that the overall approach recommended is a little too focused on reflecting a series of imperfect policies, which themselves are highly inconsistent, rather than taking a step back and asking what the overall role of UK government should be, and how best to advance the overall policy objectives. This is particularly important given the major changes that will be needed to put the UK on a low carbon trajectory, and the essential role that Government has in advancing this.

In practical terms, I could not understand why a single value was recommended for the traded sector, when the approach that is recommended for the non-traded and long-term sectors has a central value and a range. There has always been an issue of consistency with these values (which one gets from using a single estimate) vs. uncertainty (which can be represented by using a range). There are many advantages to the use of a single consistent value across Government, and this was the priority in the previous guidance, on the basis of cost-effectiveness and efficiency. In this set of guidance, the use of a range is now recommended for two areas, but at the same time the guidance recommends a single value for the traded sector: Why is there this inconsistency and what is the main overarching objective that the guidance is trying to advance?

I also found the overall review a little light on practical aspects. I suspect this will come with further guidance, but it is worth noting that when the UK Government previously used a range of values for carbon appraisal, there was inconsistent use by policy analysts across departments, i.e. some used the low or high values from the range, some used the central value only, etc. If there is going to be a central value and a recommended range, there needs to be stronger guidance about how these values should be used, and on the implications of the results, e.g. if a policy does not pass a CBA test with the central value, what steps need to be taken? Should it be re-evaluated in terms of carbon mitigation options, or should this trigger a more detailed analysis with a central unit? And I was a little unclear about the practical implications of a policy that increased emissions – is this just reflected in the RIA, or is the guidance recommending that some ameliorative or offsetting action is then required? I was also a little unclear about the specific value that would be used for electricity across all areas – does this come from the traded sector price?

I also felt there were important implications from the potential use of different values in different sectors that needed to be investigated further. Imagine a policy that affected both traded and non-traded sectors, which then uses two different prices in appraisal – how this will be viewed by those industries or individuals affected within the two areas?

Finally, given the speed of changes in this area, a two year review period seems too long, at least in the immediate future.

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For the traded sector

As above, I don't understand the logic for using a central value in this sector, when a range is used in other areas (non-traded and longer term). Are traded prices much more certain than the marginal abatement costs in the non-traded sector? (traded prices themselves reflect marginal abatement costs associated with given caps). I also felt that the analysis only drew on a very small sub-set of modelling estimates for future prices. There is now an extremely wide literature on the future prices of the ETS, with major European inter-comparison analysis, yet the assessment only takes account of two models, the EC's own models and analysis (which has some major issues, and is subject to a degree of optimism bias) and the UK Government's models. I believe a much wider review of the values is needed.

However, the main concern I have is regarding the use of market prices, and the implications for the UK. In particular, the use of (low) market prices reflecting traded prices may not be appropriate for use in Government appraisal, or at very least it should be highlighted what this implies for the UK in relation to the level of UK vs domestic action and the potential for achieving longer-term targets. There appears to be a major mis-match between the traded price of carbon under the price forecasts used for 2020, and the level of prices needed to put us on a real path towards long-term stabilisation, as reported in 2030. This can be seen in the huge price differential between the recommended market price in 2020 (£26/tCO₂) and the recommended marginal abatement cost in 2030 (£70/tCO₂). While the target tightens over this decade, the very large jump suggests a significant disconnect between the political target (an associated trading scheme price in 2020, noting this includes some degree of international allowances) versus the realistic level of action required to put us on a path to deliver the long-term target.

So what does this imply? Surely this will mean a risk of a low level of pro-active policy action (domestically) in the UK compared to other European countries, and so compared to many countries, the UK will become a larger buyer of credits. Surely it must also imply that the UK Government will not provide the necessary policies and environment to incentivise the UK traded sector, compared to European competitors and so lose any first mover advantage towards the development of new carbon technology, as well as running the risk of the lock-in of carbon intensive capital. Surely it implies a much steeper reduction path for the traded sector post 2020, and given that steeper reduction paths are likely to be much more costly, this suggests this approach is inefficient in the longer term for the UK.

Perhaps most importantly, it runs the risk that we make the long-term cuts needed in this sectors extremely challenging (maybe even impossible). The rate of decarbonisation needed to move from the position associated with a carbon price of £26/tCO₂ to 2020 to the 2030 and especially 2050 goals may be technical unfeasible or prohibitively expensive. It also makes the achievement of future deeper cuts (to lower stabilisation levels) essentially impossible for the UK, should these be needed from a change in scientific evidence. This implies a loss of option value. This can be inferred by some of the initial work undertaken by the CCC² on carbon budgets. Given the role of Government here, any methodological approach should consider the extent to which interim targets and price levels keep options open for the longer term, thereby avoiding irreversible commitments. At the moment, the approach adopted for the traded sectors does not do this.

On long-term policy

I agree with the board proposal that IAMs and the SCC have a role as an input to long-term policy targets, but should not determine it (e.g. through optimisation analysis). However, I found that the current proposal considerably overstates the confidence in the IAMs, and attaches too greater importance to the SCC numbers alone.

The paper does not fully capture the necessary role for other inputs, including scientific evidence, risk assessment, etc adequately and gives too much emphasis to the SCC value (implying it could act as a check to the mitigation costs associated with stabilisation targets set on the basis of this wider

² see the work by Simon Dietz on the value of acting earlier or later (Appendix 3) and on the option value associated with short and long-term targets (William Blyth, Appendix 4) in Watkiss et al, 2008. Paul Watkiss Associates, published as technical report to the CCC, <http://www.theccc.org.uk/reports/supporting-research/>

consideration). The paper is not clear on exactly how long-term targets, or implied overall shorter-term carbon target, should be undertaken.

There also remains some difficult theoretical (and ethical) issues with the application of SCC values into domestic policy appraisal, not least because of the issues of whether to use equity weights for damages – and the implications this has on whether and how to adjust marginal abatement costs to ensure consistency; and on the appropriate use of global values in domestic decisions for CBA³. These are not discussed in the paper.

The paper also only focuses on one IAM, when there are several in the literature, and these have equal relevance in the consideration of the use of these models for policy input.

On the long-term marginal abatement costs, there has been considerable work since the IPCC on inter-model comparisons (e.g. within the Energy Modelling Forum, which has standardised inter-comparisons, and within the EC's ADAM project, which has looked at comparison of stabilisation runs). This includes a wider suite of models and it would be useful to compare the existing comparison against this literature.

Finally, please note that the funding for the PAGE model updated by Dr Chris Hope is part financed by the European Commission, RTD ClimateCost project, as well as from DECC/OCC.

On the non-traded sector, and on the use of ancillary air quality effects

I found the treatment of ancillary air quality effects to be problematic. I support the view that policy needs to assess the economic costs or benefits of ancillary effects including air quality, and I understand that air quality effects will change the relative attractiveness of options, but I found the approach proposed insufficient.

The problem with the approach proposed is it starts to merge two frameworks and metrics, i.e. it takes social damage costs for air pollution, and subtracts or adds these to marginal abatement cost estimates. In this respect, it is trying to make the framework closer to more traditional CBA. I think this approach is inconsistent – if the framework is cost-effectiveness, then one can take account of other parameters by running a multiple optimisation analysis with other constraints (e.g. achieving air quality targets). If the framework is cost-benefit analysis, then you need to consider other costs and benefits, as these will also affect the relative attractiveness of options.

In relation to this, why does the paper only consider one ancillary effect (air quality)? Why does Defra take account of this effect, but not others which could also affect the ranking of measures? As examples, why not take account of ancillary impacts or benefits for non-technical transport measures (e.g. noise levels, accident rates, congestion for transport) – noting that in previous policy assessments, these often dominate the overall RIA of policies (carbon values actually turn out to be a minor part of the overall present value). In practice, the marginal abatement cost curve is insufficient for the consideration of policy ranking of options, at least when translated into policy, because of all these other factors could shift the relative attractiveness of options, thus leading to a different price being read off the curve. What is needed is a more comprehensive analysis for the non-traded sector of what these other factors would mean for the overall order of attractiveness of options. Failure to do this runs the risk that some of the options currently included in the cost curve, and determining the price, will not pass a policy CBA, and therefore there is a significant risk that the targets will not be achieved.

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³ Anthoff, D., Hepburn, C. and Tol, R.S.J. 2006. Equity weighting and the marginal damage costs of climate change. Working Paper FNU-1214. Hamburg: University of Hamburg.
Anthoff, D. and R.S.J. Tol (2007) "On International Equity Weights and National Decision Making on Climate Change." FNU Working Paper 127