

Update short term traded carbon values for UK public policy appraisal

October 2011

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In 2009, DECC set out a methodology for producing traded sector (EU Emissions Trading System (ETS)) carbon values to 2030 in the paper 'Carbon Valuation in UK Public Policy Appraisal: A Revised Approach'¹ (July 2009). The 2009 paper also set out a schedule for annual updates to the values.

In line with this schedule, Table 1 below shows the 2011 revised short term traded carbon values for use in HMG appraisal. The values are based on an EU 20% target.

The changes to the values are consistent with the approach set out in 'Carbon Valuation in UK Policy Appraisal: A Revised Approach' but are updated for new information (details below). The impact of this new information has led to an upward revision to the traded sector carbon values when compared to the previous updated² values.

This upward revision stems principally from; a) revised cap estimates; b) updated data on actual emissions; c) revisions to the estimates of abatement potential in the EU power and industrial sectors and d) inclusion of assumptions of market myopia on future carbon prices. DECC's 2011 updated fossil fuel price projections have also been incorporated in this update. The effect of these individual changes is explained in more detail below.

The first change to the modelling is that assumptions on the future level of the EU ETS cap over time have been revised in line with new information on EU ETS opt-ins/outs, emissions and sectors covered and a better understanding of the methodology for determining the cap. The new assumptions of the Phase III cap are marginally lower than previously thought. A lower cap increases the effort required within the ETS which leads to an increase in price.

Secondly, the modelling now takes account of actual verified emissions levels from 2008 to 2010. Emissions between 2008 and 2010 were higher than we would have expected under a rational market. This indicates that the market did not undertake some of the cheap abatement available to it in these years, and will instead be required to undertake more expensive abatement in later years. This leads to an increase in EUA price from 2011 onwards.

The third change to the modelling involves revisions to the estimates of abatement potential in the EU power and industrial sectors. The abatement potential at a given available price has been revised downwards. This is in part owing to some abatement potential moving into the 'business as usual' scenario (i.e. policy changes and revised fossil fuel price assumption mean that some abatement would now be undertaken in absence of a carbon price) and some abatement potential becoming more expensive. These effects lead to an increase in the carbon price.

¹ Available online at: http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/valuation/valuation.aspx

² The first update note (July 2010) is available on the DECC website at:

http://www.decc.gov.uk/assets/decc/what%20we%20do/a%20low%20carbon%20uk/carbon%20valuation/1_20100610131858_e@@_carbonvalues.pdf

Fourthly, the modelling now accounts for some market myopia. Previously the modelling has assumed that the market has perfect foresight of abatement, prices and effort until 2020 and acts in a way, through undertaking abatement and banking of allowances that minimizes the costs over the period). In reality the evidence suggests that the market does not exhibit behaviour consistent with perfect foresight. In order to improve our modelling, informational asymmetries have been modelled to better mimic the behaviour of market prices. This has resulted in a lower carbon price in earlier years and a higher carbon price in later years.

The fifth major change is that modelling has been adjusted to reflect DECC's 2011 updated fossil fuel price projections. These have been incorporated into the model via adjustments to 'business as usual' emissions and the fuel-switching abatement potential in the marginal abatement cost curves. The new fossil fuel prices have resulted in a change in the price of fuel switching. Notably, gas-fired generation has become relatively more profitable throughout this decade. This lowers the effort required in the EU ETS and lowers the carbon price.

A number of other minor changes have been made, including updating assumptions of future exchange rates and Clean Development Mechanism (CDM) credit prices. The values have also been converted into 2011 real prices. Overall these minor changes increase the carbon price.

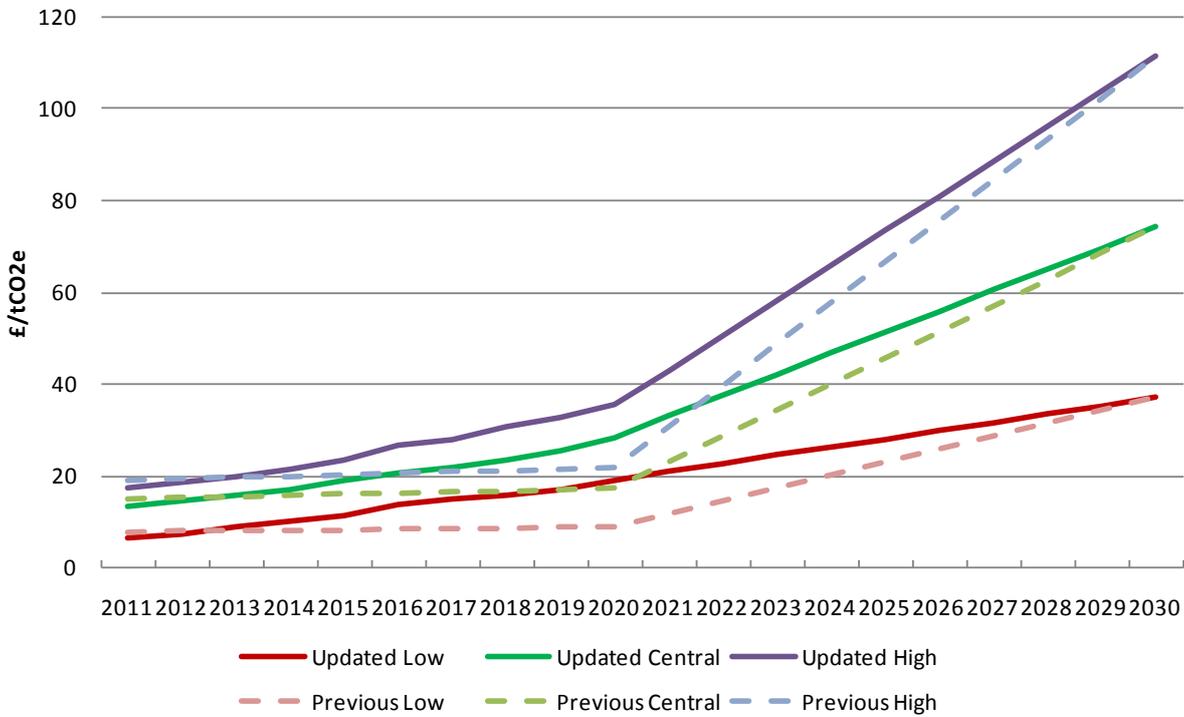
The overall impact of these changes is to increase the short term traded carbon values when compared to the 2010 short-term traded carbon values.

Table 1: DECC's 2011 updated traded sector carbon prices for use in HMG Appraisal 2011-2030 (2011 £/tCO₂e)

£/tCO ₂ e Real 2011	Updated Low	Updated Central	Updated High
2011	6	13	17
2012	7	14	18
2013	9	16	20
2014	10	17	21
2015	12	19	24
2016	14	21	27
2017	15	22	28
2018	16	24	31
2019	17	26	33
2020	19	29	35
2021	21	33	43
2022	23	38	51
2023	25	42	58
2024	26	47	66
2025	28	51	73
2026	30	56	81
2027	32	61	89
2028	34	65	96
2029	35	70	104
2030	37	74	111

In order to produce an appropriate range of carbon prices, different combinations of DECC's gas and coal fossil fuel price forecasts have been used.

Graph 1: DECC's previous (July 2010) and updated (October 2011) traded sector carbon prices for use in HMG Appraisal (all in £2011 prices)



Please note that these values are based on a specific set of assumptions with respect to the move from Phase III of the EU ETS (ending in 2020) to a fully functioning and comprehensive global carbon market in 2030³. Consequently these values should not be considered as “forecasts” of future prices and DECC accepts no responsibility for any liability arising from the use of these figures.

³ See description of methodology in Carbon Valuation in Public Policy Appraisal: A Revised Approach - http://www.decc.gov.uk/en/content/cms/what_we_do/lc_uk/valuation/valuation.aspx

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URN 11D/879