

Updated short term traded carbon values for UK public policy appraisal (June 2010)

The previous traded (EU Emissions Trading System (ETS)) carbon values are detailed in the paper 'Carbon Valuation in UK Public Policy Appraisal: A Revised Approach'¹, July 2009. This paper sets out a clear schedule for revising the carbon values:

- The short term traded carbon values (out to 2030) will be revised annually;
- The long term traded carbon values and non-traded carbon values will be revised every five years, beginning in 2011.

In line with this schedule, Table 1 below shows the revised short term traded carbon values (highlighted in yellow). Tables 2-4 set out the fossil fuel price assumptions to which they relate. The non-traded values and long term traded values remain unchanged.

The changes to the values are consistent with the approach set out in 'Carbon Valuation in UK Policy Appraisal: A Revised Approach' but updated for new information on, for example, economic growth and changes in scope to the EU ETS. The impact of this new information on the DECC carbon price model has been to revise the carbon values significantly downwards.

One of the main changes to the modelling is to the estimated level of emissions that would take place without the EU ETS, that is, the business-as-usual emissions. Lower economic growth across the EU has led to lower demand for electricity and carbon-intensive industrial products, and therefore a lower expected level of business-as-usual emissions. This has the effect of lowering EU Allowance (EUA) prices as the amount of abatement that is required in the EU ETS is reduced.

Another significant change to the modelling has been to incorporate more detailed research into the abatement options available in the industrial sectors covered by the EU ETS. This research shows that there is a greater range of abatement options in these sectors than we have previously assumed, which has the effect of lowering our carbon values.

A number of other minor changes have been made, including adjusting the cap for the emissions from sectors coming into the system from 2013, and assuming that the price of Clean Development Mechanism (CDM) credits is set by the global demand for credits rather than by the EU ETS alone. These have not significantly altered the forecast price.

The overall impact of these updates is to revise downwards the previous short-term traded carbon values. The values are based on an EU 20% target.

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

Table 1: Summary of all carbon values and sensitivities for 2010-2100 (2009 £/tCO₂e)

£2009	Traded			Non-traded		
	Low	Central	High	Low	Central	High
2010	7.3	14.1	17.8	25.9	51.7	77.6
2011	7.4	14.3	18.1	26.2	52.5	78.7
2012	7.5	14.5	18.3	26.6	53.3	79.9
2013	7.6	14.7	18.6	27	54.1	81.1
2014	7.7	14.9	18.9	27.4	54.9	82.3
2015	7.9	15.1	19.2	27.8	55.7	83.5
2016	8	15.4	19.5	28.3	56.5	84.8
2017	8.1	15.6	19.7	28.7	57.4	86.1
2018	8.2	15.8	20	29.1	58.2	87.4
2019	8.3	16.1	20.3	29.6	59.1	88.7
2020	8.5	16.3	20.7	30	60	90
2021	11.1	21.7	29.1	30.5	61	91.5
2022	13.8	27.1	37.5	31	62	93
2023	16.4	32.4	46	31.5	63	94.5
2024	19.1	37.8	54.4	32	64	96
2025	21.7	43.2	62.8	32.5	65	97.5
2026	24.4	48.5	71.3	33	66	99
2027	27	53.9	79.7	33.5	67	100.5
2028	29.7	59.3	88.1	34	68	102
2029	32.3	64.6	96.6	34.5	69	103.5
2030	35	70	105	35	70	105
2031	38.3	76.5	114.8	38.3	76.5	114.8
2032	41.5	83	124.5	41.5	83	124.5
2033	44.8	89.5	134.3	44.8	89.5	134.3
2034	48	96	144	48	96	144
2035	51.3	102.5	153.8	51.3	102.5	153.8
2036	54.5	109	163.5	54.5	109	163.5
2037	57.8	115.5	173.3	57.8	115.5	173.3
2038	61	122	183	61	122	183
2039	64.3	128.5	192.8	64.3	128.5	192.8
2040	67.5	135	202.5	67.5	135	202.5
2041	70.8	141.5	212.3	70.8	141.5	212.3
2042	74	148	222	74	148	222
2043	77.3	154.5	231.8	77.3	154.5	231.8
2044	80.5	161	241.5	80.5	161	241.5
2045	83.8	167.5	251.3	83.8	167.5	251.3
2046	87	174	261	87	174	261
2047	90.3	180.5	270.8	90.3	180.5	270.8
2048	93.5	187	280.5	93.5	187	280.5
2049	96.8	193.5	290.3	96.8	193.5	290.3
2050	100	200	300	100	200	300
2051	102.5	207.1	311.6	102.5	207.1	311.6
2052	104.8	213.9	323	104.8	213.9	323
2053	107.1	220.8	334.5	107.1	220.8	334.5
2054	109.3	227.7	346.1	109.3	227.7	346.1
2055	111.3	234.4	357.4	111.3	234.4	357.4
2056	113.3	241.1	368.8	113.3	241.1	368.8
2057	115.1	247.5	380	115.1	247.5	380

£2009	Traded			Non-traded		
	Low	Central	High	Low	Central	High
2058	116.8	253.8	390.9	116.8	253.8	390.9
2059	118.3	260	401.8	118.3	260	401.8
2060	119.7	266.1	412.5	119.7	266.1	412.5
2061	120.5	270.9	421.2	120.5	270.9	421.2
2062	121.3	275.7	430	121.3	275.7	430
2063	121.8	280	438.1	121.8	280	438.1
2064	122.1	284	445.9	122.1	284	445.9
2065	122.2	287.6	452.9	122.2	287.6	452.9
2066	122.3	291.1	459.9	122.3	291.1	459.9
2067	122	294	466.1	122	294	466.1
2068	121.7	296.7	471.8	121.7	296.7	471.8
2069	121.1	299	476.9	121.1	299	476.9
2070	120.4	301	481.6	120.4	301	481.6
2071	119.7	302.9	486.2	119.7	302.9	486.2
2072	118.8	304.5	490.3	118.8	304.5	490.3
2073	117.8	305.9	494.1	117.8	305.9	494.1
2074	116.6	306.7	496.9	116.6	306.7	496.9
2075	115.4	307.6	499.9	115.4	307.6	499.9
2076	113.8	307.7	501.5	113.8	307.7	501.5
2077	112.3	307.8	503.2	112.3	307.8	503.2
2078	110.7	307.4	504.2	110.7	307.4	504.2
2079	108.9	306.8	504.8	108.9	306.8	504.8
2080	107	305.7	504.4	107	305.7	504.4
2081	105.4	305.6	505.7	105.4	305.6	505.7
2082	103.7	304.9	506.1	103.7	304.9	506.1
2083	101.8	304	506.1	101.8	304	506.1
2084	99.9	302.8	505.7	99.9	302.8	505.7
2085	98.1	301.9	505.6	98.1	301.9	505.6
2086	96.1	300.3	504.5	96.1	300.3	504.5
2087	94	298.5	502.9	94	298.5	502.9
2088	92	296.6	501.3	92	296.6	501.3
2089	89.8	294.5	499.2	89.8	294.5	499.2
2090	87.7	292.3	497	87.7	292.3	497
2091	85.7	290.5	495.3	85.7	290.5	495.3
2092	83.7	288.6	493.6	83.7	288.6	493.6
2093	81.6	286.3	491	81.6	286.3	491
2094	79.5	283.9	488.3	79.5	283.9	488.3
2095	77.4	281.4	485.4	77.4	281.4	485.4
2096	75.3	278.9	482.4	75.3	278.9	482.4
2097	73.2	276.4	479.6	73.2	276.4	479.6
2098	71.1	273.5	475.9	71.1	273.5	475.9
2099	69.1	270.9	472.7	69.1	270.9	472.7
2100	67	268	469	67	268	469

Tables 2-4: Fossil fuel price assumptions²

(Note: detailed yearly assumptions available on request)

Scenario 1 - Low Global Energy Demand ("Low" prices scenario)			
2008 prices	Oil - Brent	Gas - NBP	Coal - ARA
Year	\$/barrel	p/therm	\$/tonne
2008	102	58	147
2010	50	34	80
2015	58	35	50
2020	60	35	50
2025	60	36	50
2030	60	36	50

Scenario 2 - Timely Investment, Moderate Demand ("Central" prices scenario)			
2008 prices	Oil - Brent	Gas - NBP	Coal - ARA
Year	\$/barrel	p/therm	\$/tonne
2008	102	58	147
2010	70	58	110
2015	75	63	80
2020	80	67	80
2025	85	71	80
2030	90	74	80

Scenario 3 - High Demand, Producers' Market Power ("High" prices scenario)			
2008 prices	Oil - Brent	Gas - NBP	Coal - ARA
Year	\$/barrel	p/therm	\$/tonne
2008	102	58	147
2010	84	70	120
2015	102	83	100
2020	120	97	100
2025	120	97	100
2030	120	97	100

² All assumptions are in 2008 prices. The exchange rate used for conversion from \$ to £ is 1.60. The rate of conversion typically used from \$/tonne to \$/GJ is 25.12 (i.e. \$100/tonne is equivalent to \$3.98/GJ).