ANNEX C

UK CO_2 Emissions Projections

Headline CO_2 Projections to 2020

The DTI forecasts a range of possible future carbon dioxide emissions levels, which reflect four scenarios:

- a high fossil fuel price scenario
- a central fossil fuel price scenario, where the assumed prices somewhat favour gas in generation
- a central fossil fuel price scenario, where the assumed prices somewhat favour coal in generation
- a low fossil fuel price scenario.

Current CO_2 projections[1] (Table C1), which do not take account of proposals set out in the main body of this report, show emissions falling up to 2010 due to measures contained in the Climate Change Programme, but increasing to 2015 as the effect of the existing measures is more than counterbalanced by the increase in energy demand and the closure of nuclear generation plants. Emissions fall after 2015 as a significant number of coal-fired power plants retire post 2015. Taking an average of the two central scenarios, and including the EU Emissions Trading Scheme (EU ETS), the current projections suggest a 16.2% reduction on 1990 levels by 2010, which will be a shortfall of 6.2MtC from the target of a 20% reduction in emissions relative to 1990 levels.

The impact of the EU ETS is shown in the table as a separate line. It is included as the reduction in the UK allocation of allowances (-8MtC annually) announced for Phase II of the scheme. Not all of this reduction may be achieved within the UK – the scale of abatement action within the UK will depend on the level of the carbon price across the EU as a whole.

1 The current projections (DTI Energy and CO_2 Emissions Projections to 2020 – UEP26) are available at www.dti.gov.uk/energy/review/index.html

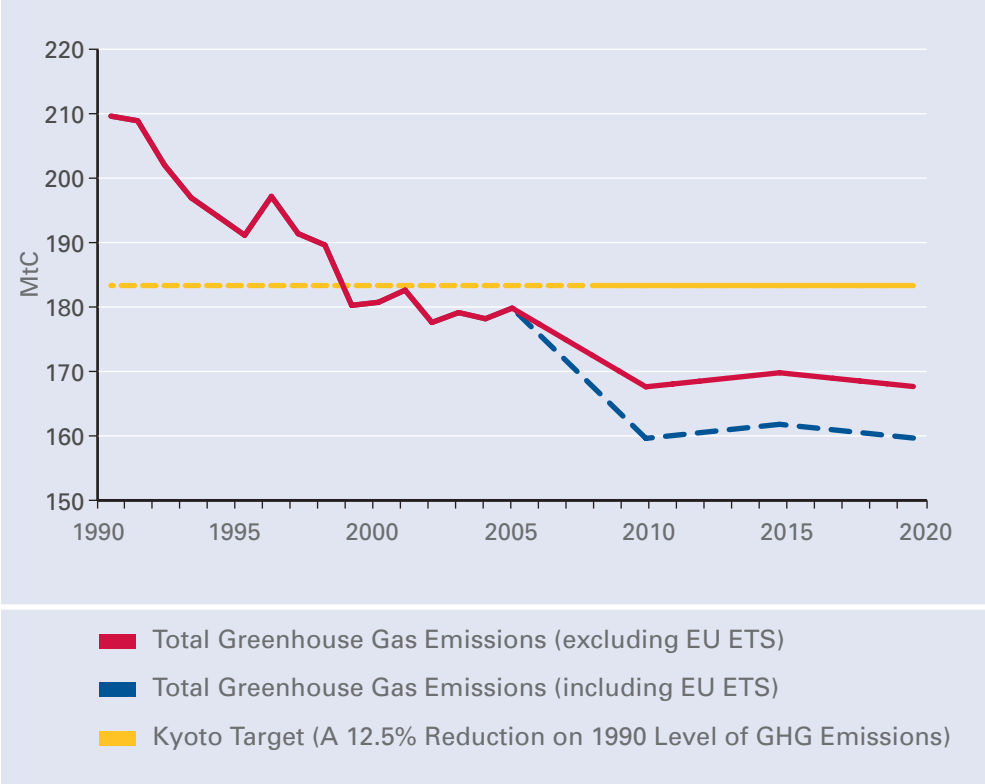
Table C1: Carbon dioxide emissions projections (1990 – 2020) (MtC)									
				Central Scenario Favourable to coal			Central Scenario Favourable to gas		
	1990	2000	2005	2010	2015	2020	2010	2015	2020
Power Stations	55.7	43.1	47.1	44.1	47.6	46.5	42.5	45.4	45.0
Refineries	5.0	4.9	5.6	5.7	5.7	5.7	5.7	5.7	5.7
Residential	21.1	23.2	22.3	19.8	19.9	20.1	20.3	20.4	20.6
Services	8.3	8.2	6.8	5.9	6.1	6.9	5.9	6.1	6.9
Industry	35.3	33.4	31.4	32.5	31.4	30.3	32.6	31.7	30.6
Road Transport	30.1	32.0	33.3	32.6	33.2	32.5	32.6	33.2	32.5
Off-road	1.6	1.4	1.5	1.5	1.4	1.4	1.4	1.4	1.4
Other transport	3.4	2.5	2.3	2.3	2.4	2.5	2.3	2.4	2.5
LUC(1)	0.8	-0.1	-0.6	-0.5	0.1	0.7	-0.5	0.1	0.7
Total (excl. EU ETS)	**161.4**	**148.6**	**149.8**	**143.9**	**147.8**	**146.5**	**142.9**	**146.4**	**145.8**
EU ETS	-	-	-	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Total (incl. EU ETS)	**161.4**	**148.6**	**149.8**	**135.9**	**139.8**	**138.5**	**134.9**	**138.4**	**137.8**
				High Scenario			Low Scenario		
	1990	2000	2005	2010	2015	2020	2010	2015	2020
Power Stations	55.7	43.1	47.1	44.4	48.3	49.5	40.9	41.6	39.9
Refineries	5.0	4.9	5.6	5.7	5.7	5.7	5.7	5.7	5.7
Residential	21.1	23.2	22.3	19.0	19.0	19.3	21.5	21.5	21.6
Services	8.3	8.2	6.8	5.9	6.1	6.9	5.9	6.1	6.9
Industry	35.3	33.4	31.4	32.2	30.7	29.5	32.8	31.9	30.7
Road Transport	30.1	32.0	33.4	32.1	32.3	31.7	33.1	34.0	33.5
Off-road	1.6	1.4	1.5	1.4	1.4	1.4	1.5	1.5	1.5
Other transport	3.4	2.5	2.3	2.3	2.3	2.4	2.4	2.5	2.6
LUC(1)	0.8	-0.1	-0.6	-0.5	0.1	0.7	-0.5	0.1	0.7
Total (excl. EU ETS)	**161.4**	**148.6**	**149.8**	**142.5**	**145.9**	**146.9**	**143.3**	**145.0**	**142.9**
EU ETS	-	-	-	-8.0	-8.0	-8.0	-8.0	-8.0	-8.0
Total (incl. EU ETS)	**161.4**	**148.6**	**149.8**	**134.5**	**137.9**	**138.9**	**135.3**	**137.0**	**134.9**

(1) Land Use Change

Progress towards Kyoto

The Kyoto target is based on a basket of greenhouse gases (GHG) of which CO_2 emissions represent the largest share. The UK remains on track to comfortably go beyond its Kyoto commitment. Thus the current CO_2 projections (UEP26) combined with the emissions of other (non- CO_2) greenhouse gases suggest that in 2010 total UK greenhouse gas emissions, without the EU ETS, will be some 20% below the base year level[2]. Including the EU ETS, the projected reduction is almost 24%. Chart C1 below illustrates the projected total greenhouse gas emissions relative to the UK Kyoto target after incorporating the current CO_2 projections (UEP26).

FIGURE 1: TOTAL GREENHOUSE GAS EMISSIONS (1990-2020)



Source: DTI

2 Historic GHG figures are on the 1990-2003 inventory basis.

Revisions to Previous Projections to 2020

Since the previous CO_2 projections (UEP 21) were published in February 2006[3], there have been a number of developments arising from the Budget announcements in March 2006, developments in UK population statistics, additional policy measures announced in the Climate Change Policy Review and responses received to the February 2006 consultation on EU ETS Phase II CO_2 emissions projections[4]. There has also been a re-assessment of fossil fuel prices. Generally, fossil fuel prices in 2010 are assumed to be higher than previously and to rise further between 2010 and 2020. This is to reflect the signs that demand for oil appears more robust to higher prices than previously assumed and supply is still expected to remain relatively tight even after expected increases in supply in the next few years. Table C2 sets out the fossil fuel price assumptions used for the current CO_2 projections (UEP 26).

Table C2: Fossil fuel price assumptions

	Central Scenario Favourable to coal			Central Scenario Favourable to gas		
Real 2005 prices	Crude Oil	Natural Gas	ARA Coal	Crude Oil	Natural Gas	ARA Coal
	$/bbl	NBP p/therm	$/GJ	$/bbl	NBP p/therm	$/GJ
2005	55.0	41.0	2.4	55.0	41.0	2.4
2010	40.0	33.5	1.9	40.0	25.8	1.9
2015	42.5	35.0	1.9	42.5	27.3	1.9
2020	45.0	36.5	1.8	45.0	28.0	1.8
	High Scenario			Low Scenario		
Real 2005 prices	Crude Oil	Natural Gas	ARA Coal	Crude Oil	Natural Gas	ARA Coal
	$/bbl	NBP p/therm	$/GJ	$/bbl	NBP p/therm	$/GJ
2005	55.0	41.0	2.4	55.0	41.0	2.4
2010	67.0	49.9	2.6	20.0	18.0	1.4
2015	69.5	51.4	2.6	20.0	19.5	1.2
2020	72.0	53.0	2.6	20.0	21.0	1.0

3 These are available http://www.dti.gov.uk/files/file26363.pdf
4 A full response to the consultation will be available shortly.

Table C3 below illustrates the revised generation fuel mix consistent with the current CO_2 projections (UEP 26) for the two central cases up to 2020, which shows how coal and nuclear plant closures affect the changing mix over the next few years.

Table C3: Electricity generation fuel mix (TWh)[5]

Central favourable to gas	1990	1995	2000	2005	2010	2015	2020
coal	204	145	112	126	106	100	82
oil	15	9	2	2	2	2	1
gas	0	57	127	135	137	183	235
nuclear	59	81	78	75	73	34	26
renewables	5	6	10	17	33	53	53
imports	12	16	14	11	11	11	11
pumped storage	2	2	3	3	3	3	3
Total	**298**	**315**	**346**	**369**	**365**	**386**	**411**
Central favourable to coal	**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2020**
coal	204	145	112	126	119	116	94
oil	15	9	2	2	3	2	2
gas	0	57	127	135	122	164	219
nuclear	59	81	78	75	73	34	26
renewables	5	6	10	17	33	53	53
imports	12	16	14	11	11	11	11
pumped storage	2	2	3	3	3	3	3
Total	**298**	**315**	**346**	**369**	**362**	**383**	**407**

EU ETS and Projections

The current CO_2 emissions projections (UEP 26) have been prepared before taking account of the impact of the EU ETS[6]. The impact of including the reduction in the UK allocation now announced for Phase II is, however, shown in the summary tables above. Abatement effort within the UK will reflect the level of the carbon price and the behavioural response to that price. This carbon price will depend on the UK and other member states' allocations for 2008-12; levels and relativities of fossil fuel prices; abatement options; and availability of JI and CDM credits.

5 The coverage of the industry is major power producers plus all other renewable generators. All other generators of electricity are included within the industrial or commercial sectors.

6 Exclusion of the EU ETS has reflected a number of considerations: the UK's allocation decision for Phase II has been informed, amongst other factors, by the projections before the ETS; there is considerable uncertainty over the level of carbon price in the scheme, which will be determined by other member states allocations, as well as the UK's.

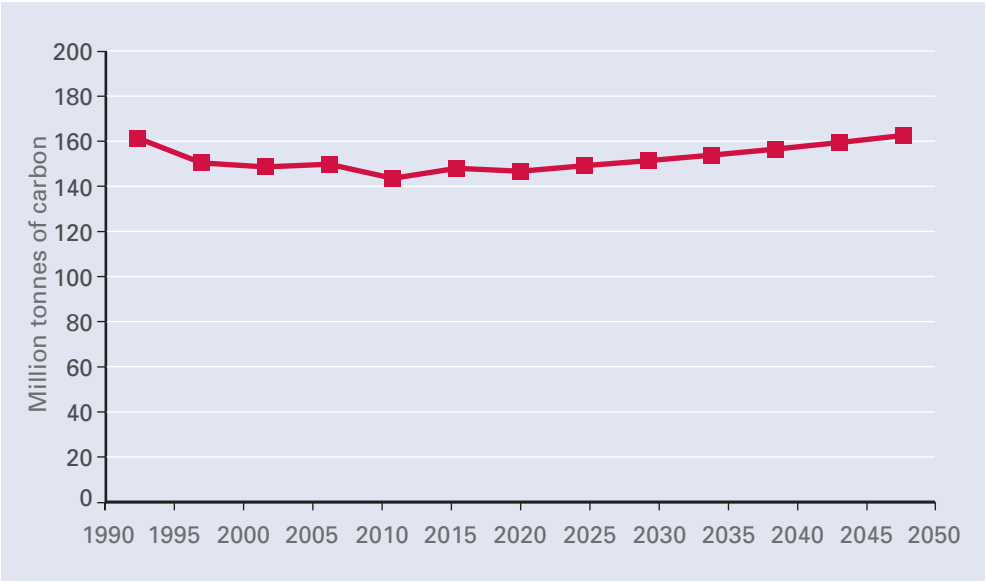
Longer Term Trends to 2050

Longer-term trends[7], excluding the proposals set out in the main body of this report, suggest that total UK energy demand and emissions are expected to continue to rise beyond 2020 (Table C4 and chart C2).

Table C4: Projected CO_2 emissions, by sector, to 2050 (MtC)

	Residential sector	Transport sector	Industry	Services	Total CO_2 emissions (including LUC)
1990	40.3	40.0	56.4	23.8	161.4
2000	38.8	41.1	48.9	20.7	143.5
2010	36.7	42.4	45.8	19.5	146.7
2030	41.1	41.5	46.6	21.6	151.4
2050	47.3	40.5	50.3	23.8	162.6

CHART C2: LONG-TERM PROJECTED CO_2 EMISSIONS, TO 2050 (BASED ON NO FURTHER GOVERNMENT ACTION)



Source: DTI, 2006

7 Detailed results and assumptions behind longer-term trends to 2050 are included in the paper on the UEP26 projections, which is available at www.dti.gov.uk/energy/review/index.html