

United Kingdom

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1. SUMMARY

The UK's 2007 Monitoring Mechanism submission report projects 2010 total emissions to be around 19.5% below the Kyoto base year against a target to reduce emissions to 12.5 % below the Kyoto base year, considering the effect of domestic action only. The greatest reductions relative to 1990 emissions are expected to occur in the Waste and Industrial Process sectors. These sectors are expected to account for just 7% of total emissions in 2010. Significant reductions are also expected in the Agriculture, Energy Supply and Use sectors. The only increase in emissions is expected in the Transport sector, with emissions projected to increase by 11% by 2010 compared to 1990. This is despite considerable policy efforts in the sector, expected to save 24.6 Mt in 2010 compared to a scenario in which the policies are not implemented. Similarly, a number of policies in the energy sector, particularly the EU Emissions Trading Scheme in the second trading period, are expected to deliver the savings required to achieve the forecasted projections.

In addition to domestic efforts, ETS participants are expected to purchase 29.333 MtCO₂-eq. of European Allowance Units or carbon credits from Kyoto mechanisms. The UK also expects carbon sinks to reduce emissions by 4.1 Mt CO₂-eq. in 2010.

According to the UK's 2007 Monitoring Mechanism submission, the UK planned to submit an updated set of UK greenhouse gas emissions projections in June 2007, including a 'With Additional Measures' projection scenario in line with the Energy White Paper released in May 2007. However, the UK's energy projections were not available in time to update the projections. Additional measures foreseen in the UK's Energy White Paper (amounting to approximately 3 MtCO₂-eq.) were not included in the 2007 UK submission under the EUMM, so do not feature in this report's figures and calculations.

In total, considering the domestic and non-domestic actions outline above, as well as additional measures contained in the Energy White Paper, the UK would overachieve its Kyoto target of 679.3 Mt CO₂-eq. by around 12 % points. This amount of overachievement is slightly greater than reported in 2006 and it is worth noting the substantial increases in the implied Kyoto commitment between 2005 and 2007 reports due to upwards revisions of the base year emissions, and in projections of UK emissions.

2. GHG PROJECTIONS AND PROGRESS TO KYOTO TARGETS

Table 1 shows, for all gases and main sectors:

- GHG emission projections for the “With Existing Measures” (WEM) scenario, as reported by the UK; The UK does not provide an ‘additional measures’ projection for 2010. A ‘without measures’ projection is provided for CO₂ only.
- Historic emissions (in the “reference year”) as reported together with projections.

For the UK, the reference year is the Kyoto base-year: 1990 for CO₂, CH₄ and N₂O, and 1995 for fluorinated gases (F-gases).

Kyoto base year emissions for the UK, Portugal and Netherlands include LULUCF, however all Country Profiles compare projections without LULUCF. LULUCF will be covered in the main report.

Table 1. Summary of reported projections by sector and by gas in 2010 (Mt CO₂-eq.)

	Carbon dioxide			Methane			Nitrous oxide			F-gases			Total		
	Reference year	2010 WEM	2010 WAM	Reference year	2010 WEM	2010 WAM	Reference year	2010 WEM	2010 WAM	Reference year	2010 WEM	2010 WAM	Reference year	2010 WEM	2010 WAM
Energy (excl. transport)	457.3	392.2	NE	30.6	9.6	NE	4.6	3.5	NE	NA	NA	NE	492.5	405.4	NE
Energy supply	243.0	207.6	NE	28.7	8.8	NE	1.9	1.4	NE	NA	NA	NE	273.7	217.8	NE
Energy – industry, construction	99.6	85.8	NE	0.3	0.3	NE	1.6	1.5	NE	NA	NA	NE	101.5	87.6	NE
Energy – other (commercial, residential, agriculture)	114.7	98.8	NE	1.6	0.5	NE	1.0	0.7	NE	NA	NA	NE	117.3	100.0	NE
Transport (energy)	116.8	125.1	NE	0.6	0.1	NE	1.3	6.3	NE	NA	NA	NE	118.7	131.4	NE
Industrial processes	15.0	11.7	NE	0.2	0.1	NE	24.7	2.5	NE	17.2	10.2	NE	57.0	24.5	NE
Waste	1.2	0.8	NE	50.6	19.7	NE	1.1	1.3	NE	NA	NA	NE	52.9	21.8	NE
Agriculture	NO	NO	NE	21.6	16.3	NE	32.1	25.6	NE	NA	NA	NE	53.7	41.8	NE
Other	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Total (excl. LULUCF)	590.7	529.7	NE	103.6	45.8	NE	63.6	39.2	NE	17.2	10.2	NE	774.8	624.9	NE

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Key:

Reference year: base-year under the Kyoto Protocol (1990 for carbon dioxide, methane and nitrous oxide, and 1995 for F-gases).

WEM: 'With Existing Measures' projection

WAM: 'With Additional Measures' projection

Source: UK's national report submitted to the European Commission under the Monitoring Mechanism, Decision 280/2004/EC. Report and template submitted 31 May 2007.

Table 2 shows, for all gases and main sectors:

- 1990 GHG emissions as reported in the latest (2008) GHG emissions inventory (1990-2006);
- Adjusted GHG emission projections for the WEM scenario. This adjustment of the projections reported in Table 1 is carried out to allow consistency and comparability between projections and the latest (2008) GHG inventory data¹.

Table 2. Summary of projections by sector and by gas in 2010 compared to 1990 emissions (MtCO₂-eq.)

	Carbon dioxide			Methane			Nitrous oxide			F-gases			Total		
	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM
Energy (excl. transport)	457.1	392.5	NE	30.6	9.7	NE	4.6	3.5	NE	NA	NA	NE	492.3	405.7	NE
Energy supply	243.0	207.7	NE	28.7	8.8	NE	1.9	1.4	NE	NA	NA	NE	273.7	218.0	NE
Energy – industry, construction	99.4	85.8	NE	0.3	0.3	NE	1.6	1.5	NE	NA	NA	NE	101.4	87.6	NE
Energy – other (commercial, residential, agriculture)	114.7	98.9	NE	1.5	0.5	NE	1.0	0.7	NE	NA	NA	NE	117.2	100.0	NE
Transport (energy)	117.0	125.1	NE	0.6	0.1	NE	1.3	6.3	NE	NA	NA	NE	118.9	131.5	NE
Industrial processes	15.3	11.7	NE	0.2	0.1	NE	24.7	2.5	NE	13.8	10.2	NE	53.9	24.5	NE
Waste	1.2	0.8	NE	50.7	19.7	NE	1.1	1.3	NE	NA	NA	NE	52.9	21.8	NE
Agriculture	NO	NO	NE	21.6	16.3	NE	32.3	25.6	NE	NA	NA	NE	53.9	41.9	NE
Other	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Total (excl. LULUCF)	591.0	530.1	NE	103.7	45.9	NE	63.9	39.2	NE	13.8	10.2	NE	772.0	625.4	NE

¹ The adjustment consists in applying an adjustment factor to projections from Table 1. This factor is the ratio between total emissions in the reference year as reported in the 2008 GHG inventory report (or, if the reference year is the base-year under the Kyoto Protocol, in the report of the review of the initial report under the Kyoto Protocol) and total emissions in the reference year as reported by the country with projections (Table 1).

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Key:

WEM: 'With Existing Measures' projection

WAM: 'With Additional Measures' projection

Source: UK's national report submitted to the European Commission under the Monitoring Mechanism, Decision 280/2004/EC. Report and template submitted 31 May 2007. UK 2008 national inventory submission, Common Reporting Format, submitted 15 April 2008.

Table 3. Summary of projections by sector and by gas in 2010 compared to 1990 emissions (index 100 = 1990)

	Carbon dioxide			Methane			Nitrous oxide			F-gases			Total		
	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM	1990	2010 WEM	2010 WAM
Energy (excl. transport)	100	85.9	NE	100	31.5	NE	100	77.9	NE	NO	NO	NO	100	82.4	NE
Energy supply	100	85.5	NE	100	30.7	NE	100	73.3	NE	NO	NO	NO	100	79.6	NE
Energy – industry, construction	100	86.3	NE	100	102.2	NE	100	90.3	NE	NO	NO	NO	100	86.5	NE
Energy – other (commercial, residential, agriculture)	100	86.2	NE	100	31.8	NE	100	66.6	NE	NO	NO	NO	100	85.3	NE
Transport (energy)	100	107.0	NE	100	20.0	NE	100	481.5	NE	NO	NO	NO	100	110.6	NE
Industrial processes	100	76.2	NE	100	42.2	NE	100	10.3	NE	100	74.0	NE	100	45.4	NE
Waste	100	65.9	NE	100	39.0	NE	100	118.2	NE	NO	NO	NO	100	41.2	NE
Agriculture	NO	NO	NO	100	75.3	NE	100	79.3	NE	NO	NO	NO	100	77.7	NE
Other	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Total (excl. LULUCF)	100	89.7	NE	100	44.2	NE	100	61.4	NE	100	74.0	NE	100	81.0	NE

Key:

WEM: 'With Existing Measures' projection

WAM: 'With Additional Measures' projection

Source: UK's national report submitted to the European Commission under the Monitoring Mechanism, Decision 280/2004/EC. Report and template submitted 31 May 2007. UK 2008 national inventory submission, Common Reporting Format, submitted 15 April 2008.

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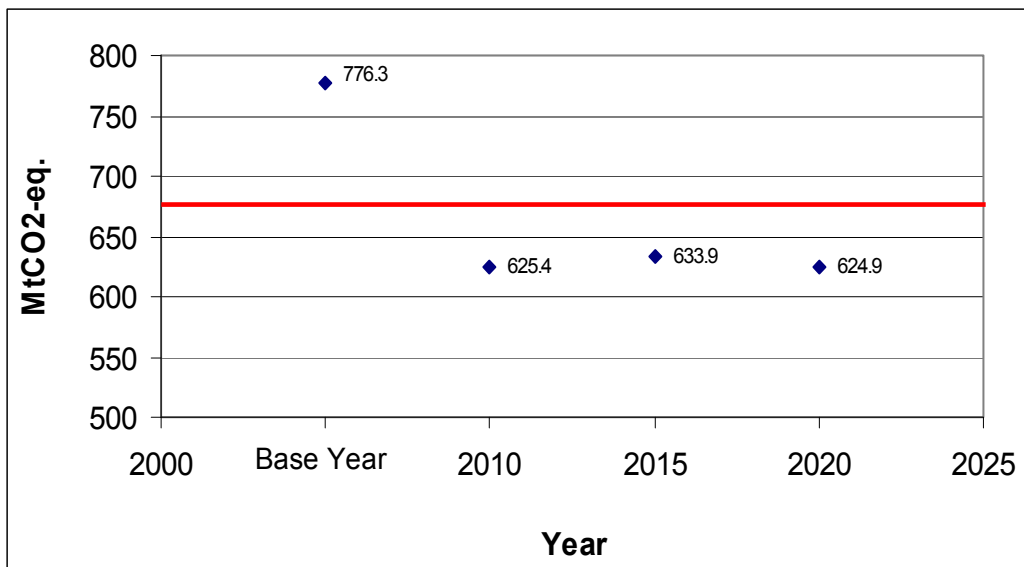
Table 4. Summary of projections in 2010 compared to base year emissions under the Kyoto Protocol

	Unit	Base-year emissions under the Kyoto Protocol	2010 projections 'With Existing Measures'	2010 projections 'With Additional Measures'
Total GHG emissions (excluding LULUCF)	Mt CO ₂ -eq.	776.3	625.4	NE
	Index (base-year emissions = 100)	100	80.6	NE

Source: UK's national report submitted to the European Commission under the Monitoring Mechanism, Decision 280/2004/EC. Report and template submitted 31 May 2007. UK 2008 national inventory submission, Common Reporting Format, submitted 15 April 2008.

In Figure 1, the same correction factor used in Table 2 has been applied to the projections for 2010, 2015 and 2020.

Figure 1. Greenhouse gas projections in 2010, 2015 and 2020 (Mt CO₂-eq.)



Source:

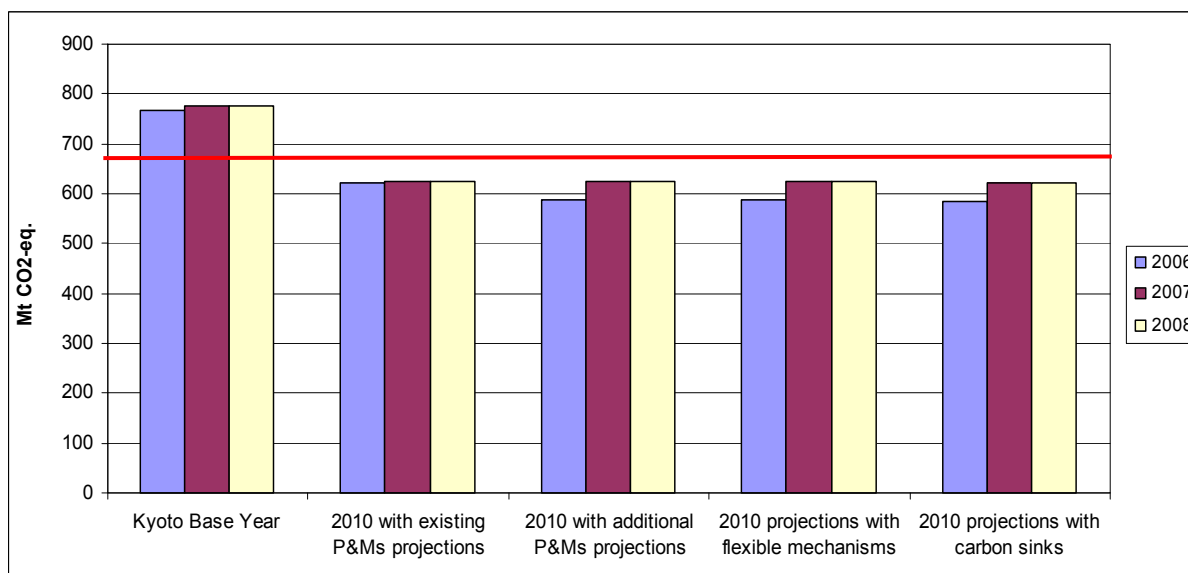
UK's national report submitted to the European Commission under the Monitoring Mechanism, Decision 280/2004/EC. Report and template submitted 31 May 2007.

UK 2008 national inventory submission, Common Reporting Format, submitted 15 April 2008.

Base-year emissions from the UNFCCC website,

http://unfccc.int/ghg_data/kp_data_unfccc/base_year_data/items/4354.php

Figure 2. Comparison of 2010 projections reported in 2006, 2007 and 2008



Source:

UK's national report submitted to the European Commission under the Monitoring Mechanism, Decision 280/2004/EC. Report and template submitted 31 May 2007.

UK 2008 national inventory submission, Common Reporting Format, submitted 15 April 2008.

Source for 2006 data is UK's 4th National Communication to the UNFCCC.

Base-year emissions from the UNFCCC website,

http://unfccc.int/ghg_data/kp_data_unfccc/base_year_data/items/4354.php

3. CLIMATE CHANGE MITIGATION POLICIES AND MEASURES

A top down calculation of existing measures was not possible as a 'without measures' projection was provided for CO₂ only.

Table 5. Summary of the effect of policies and measures included in the 2010 projections (Mt CO₂-eq.)

	Top down calculation		Bottom Up calculation	
	Existing Measures	Planned Measures	Existing Measures	Planned Measures
Energy (total, excluding transport)	NE	NA	61.6	NA
Energy supply	NE	NA	9.5	NA
Energy – industry, construction	NE	NA	0.0	NA
Energy – other (commercial, residential, agriculture)	NE	NA	52.1	0.7
Transport (energy)	NE	NA	24.6	NA
Industrial processes	NE	NA	0.0	NA
Waste	NE	NA	0.0	NA
Agriculture	NE	NA	2.9	NA
Cross-sectoral	NE	NA	30.4	NA
Total (excluding LULUCF)	NE	NA	89.7	0.7

Note: The effects of measures detailed above are calculated firstly by determining the difference between total projections in each scenario ('top down calculation') and secondly by summing the reported effect of individual measures ('bottom up calculation').

Source: UK's national report submitted to the European Commission under the Monitoring Mechanism, Decision 280/2004/EC. Report and template submitted 31 May 2007.

The UK quantifies the expected impact of all 35 policies and measures listed for the years 2010, 2015 and 2020. The total impact in 2010 is estimated to be 89.7 MtCO₂-eq. rather than the sum of the sectors in the above table (119.5) due to the interaction between policies and measures.

The UK's draft Climate Change Bill proposes a framework of five year carbon budgets to put the UK on a path to achieve long-term emissions reductions. Some of the policy measures that will contribute to these emissions reductions are outlined in the recently published 2007 Energy White Paper. Additional measures foreseen in the UK's Energy White Paper (amounting to approximately 3 MtCO₂-eq.) were not included in the 2007 UK submission under the EUMM, so do not feature in this report's figures and calculations.

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The UK's 2007 Monitoring Mechanism submission reports on two additional policies and measures:

- EU Emission Trading Scheme (ETS) 2008-2012 (29.333 MtCO₂-eq.)
- Products Policy: Consumer information and standards for lights and other energy using products (0.733 MtCO₂-eq.)

The projected emissions reductions in the UK resulting from the EU ETS are already included in the 'With Existing Measures' projections. The 29.333 MtCO₂-eq. reduction mentioned above is the amount by which the UK National Allocation Plan (NAP) is 'underallocated'. In other words, 29.333 Mt is the shortfall between projected emissions from ETS participants and the NAP cap, and is thus the amount that participants will need to buy in European Allowance Units or carbon credits from Kyoto mechanisms. This reduction will not occur in the UK and is not included in the 89.7 MtCO₂-eq. of reductions projected to occur within the UK.

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Table 6. Detailed information on Existing Policies and measures

Sector	Name	Type	GHG	Status	Estimated Savings			Costs
					[kt CO2 eq. p.a.]			[EUR/t]
					2005	2010	2020	
Cross-cutting	Carbon Trust	Fiscal	CO ₂	implemented		4,033	4,033	
		Information Research						
Cross-cutting	EU emission Trading Scheme 2005-2007	Economic	CO ₂	implemented				
Cross-cutting	EU Linking directive	Economic	CH ₄	implemented				
			CO ₂					
			HFC					
			N ₂ O					
			PFC					
			SF ₆					
Cross-cutting	UK emissions trading scheme	Economic	CH ₄	expired		1,100	1,100	
			CO ₂					
			HFC					
			N ₂ O					
			PFC					
			SF ₆					
Energy supply	Renewables Obligation	Regulatory	CO ₂	implemented		9,166	9,166	175
Energy supply	Combined heat and power	Economic	CO ₂	implemented				
Energy supply	Micro-generation	Economic	CO ₂	implemented				
Energy supply	Micro-CHP	Information						
		Economic	CO ₂	implemented				

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Energy consumption	Climate change agreements	Voluntary/ negotiated agreement	CO ₂	implemented	10,633	10,633	< 90
Energy consumption	Building Regulations 2005	Regulatory	CO ₂	implemented	733	733	
Energy consumption	Energy Efficiency Commitment (EEC) (2002-2005)	Regulatory	CO ₂	implemented	1,466	1,100	< 270
Energy consumption	Market transformation including Appliance standards and labels	Information	CO ₂	implemented	733	733	
Energy consumption	Building regulations 2006 including 2005 condensing boiler update	Regulatory Regulatory	CO ₂	implemented	2,933	2,933	
Energy consumption	Energy Efficiency Commitment (EEC) (2005-2008)	Regulatory	CO ₂	implemented	2,200	1,833	
Energy consumption	Energy Efficiency Commitments (2008-2011)	Regulatory	CO ₂	implemented	2,200	2,200	
Energy consumption	Better Billing and metering	Fiscal	CO ₂	planned	733	733	
Energy consumption	Stimulate early replacement of inefficient boilers and implementation of the energy performance of buildings directive	Information Information	CO ₂	planned	733	733	
Energy consumption	Central Government, NHS, UK universities and English Schools including Carbon Trust activities	Regulatory Economic	CO ₂	implemented	733	733	
		Information					

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Energy consumption	Revolving loan fund for the public sector	Economic	CO ₂	implemented	366	367
Energy consumption	Building Regulations 2002 in the domestic sector	Regulatory	CO ₂	implemented	2,566	2,566
Energy consumption	Building Regulations 2002 in the business sector	Regulatory	CO ₂	implemented	1,466	1,466
Energy consumption	Climate Change Communications Initiative	Information	CO ₂	implemented		
Energy consumption	Economic instruments	Economic	CO ₂	implemented		
Energy consumption	Decent homes	Fiscal Economic	CO ₂	implemented		
Energy consumption	Sustainable communities	Voluntary/ negotiated agreement	CO ₂	implemented		
Energy consumption	Energy saving trust	Information	CO ₂	implemented		
Energy consumption	Salix finance	Economic	CO ₂	implemented		
Energy consumption	The Government Estate	Voluntary/ negotiated agreement	CO ₂	implemented		
Energy consumption	Sustainable Procurement Action Plan	Other	CO ₂	implemented		
Energy consumption	Schools	Information Voluntary/ negotiated agreement	CO ₂	implemented		
Energy consumption	The UK's National Health Service (NHS)	Economic	CO ₂	implemented		

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Energy consumption	estate Carbon Trust support for Energy Efficiency in small and medium sized business	Information Economic	CO ₂	implemented	366	366	
Energy consumption	Climate Change Levy	Information Fiscal	CO ₂	implemented	13,566		< 100
Energy consumption	Warm Front and fuel poverty programs	Economic	CO ₂	implemented	1,466	1,466	
Transport	Fuel duty escalator	Fiscal	CO ₂	expired	6,966	6,966	< 371
Transport	EU level voluntary agreements on CO2 from cars, backed up by changes to company cars taxation and vehicle excise duty	Fiscal Voluntary/ negotiated agreement	CO ₂	implemented	8,433	8,433	542
Transport	Sustainable distribution in Scotland and Wales	Information	CO ₂	implemented	366	366	
Transport	Renewable transport fuel obligation (RTFO)	Regulatory	CO ₂	implemented	5,866	5,866	55
Transport	Wider transport measures	Fiscal	CO ₂	implemented	2,933	2,933	
Transport	Transport strategy	Planning	CO ₂	implemented			
Transport	Fiscal measures	Fiscal	CO ₂	implemented			
Transport	Developing and promoting new vehicle technologies	Economic	CO ₂	implemented			
Agriculture Cross-cutting	Non Food Crops	Economic Education Fiscal Information Regulatory Research	CO ₂	implemented	366	366	20,76

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Agriculture	Common agricultural policy	Economic Regulatory	CH ₄ CO ₂ N ₂ O	implemented		
Agriculture	Environmental stewardship		CH ₄ CO ₂ N ₂ O	implemented		
Agriculture	Integrated Pollution Prevention and Control (IPPC)	Information Regulatory	CH ₄ N ₂ O	implemented		
Agriculture	Catchment Sensitive Farming (CSF)	Regulatory	N ₂ O	implemented		
Forestry	Woodland Planting since 1990 (Scotland)	Economic	CO ₂	implemented	1,833	1,833
Forestry	Woodland Grant scheme (England)	Economic	CO ₂	implemented	733	733
Waste	Waste management	Fiscal Regulatory	CH ₄	implemented		

Source: Öko Institut, (accessed 24 July 2007), ECCP Policies and Measures database, <http://www.oeko.de/service/pam/index.php>

Table 7. Detailed information on Planned Policies and measures

As described in section 5, the EU ETS 2008-2012 and Products policy on energy using products are nominally assigned 'With Additional Measures' (WAM) status although there is no reported WAM projection scenario.

Sector	Name	Type	GHG	Status	Estimated Savings			Costs [EUR/t]
					2005	2010	2020	
Cross-cutting	EU emission Trading Scheme 2008-2012	Economic	CO ₂	planned		29,333	29,333	
Agriculture	Rural development	Planning	CH ₄	planned				

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			CO ₂				
			N ₂ O				
Energy consumption	Energy performance commitment	Voluntary/ negotiated agreement	CO ₂	planned			4,400
Energy consumption	Energy services	Regulatory	CO ₂	planned			
Energy consumption	Energy service directive		CO ₂	planned			
Energy consumption	Measure to encourage of assist SMES to take up energy saving opportunities	Information	CO ₂	planned	366	366	
Energy consumption	Increased activity in Energy Efficiency Commitment (EEC) 2008-2011	Regulatory	CO ₂	planned	1,833	1,833	
Energy consumption	Package of measures to improve energy efficiency in buildings	Fiscal Information Regulatory	CO ₂	planned	366	366	
Energy consumption	Additional effort by local authorities	Economic	CO ₂	planned	733	733	
Energy consumption	Products Policy: Consumer information and standards for lights and other energy using products (EUPs)	Planning Regulatory	CO ₂	planned	733	733	
Energy consumption	Energy service company		CO ₂	planned			
Energy supply	Subsidy for biomass heat	Fiscal	CO ₂	planned	366	366	
Energy supply	Carbon abatement technology strategy	Research	CO ₂	planned			

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Energy supply	Coalmine methane	Economic	CH ₄	planned
Transport	Aviation	Economic	CO ₂	planned
Industrial Processes	IPPC	Information	CH ₄	planned
		Regulatory	CO ₂	
			HFC	
			N ₂ O	
		Voluntary/ negotiated agreement	PFC	

Source: Öko Institut, (accessed 24 July 2007), ECCP Policies and Measures database, <http://www.oeko.de/service/pam/index.php>

Table 8. Status of national policies and measures (PAM) in relation to European common and coordinated policies and measures (CCPM)

Status	CCPM	Sector
National policies and measures already in force before CCPM was adopted	Taxation of energy products 2003/96/EC	Energy supply
Existing national policies and measures re-enforced by CCPM	Emissions trading 2003/87/EC	Cross-cutting
	Agreement with car manufacturers ACEA etc.	Transport
New national policies and measures implemented after CCPM was adopted	Promotion of cogeneration 2004/8/EC	Energy supply
	Promotion of electricity from RE sources 2001/77/EC	Energy supply
	Directives on energy labelling of appliances	Energy consumption
	Energy performance of buildings 2002/91/EC	Energy consumption
	Efficiency of hot water boilers 92/42/EEC	Energy consumption
	Promotion of biofuels for transport 2003/30/EC	Transport
	Transport modal shift to rail 2001/12/EC etc.	Transport
	Consumer information on cars 1999/94/EC	Transport
Support under CAP (1782/2003)	Agriculture	

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	Support under CAP - amendment (1783/2003)	Agriculture
	Landfill directive 1999/31/EC	Waste
Status of national policy or measure not reported	Kyoto Protocol project mechanisms 2004/101/EC	Cross-cutting
	Integrated pollution prevention and control 96/61/EC	Cross-cutting
	Internal electricity market 2003/54/EC	Energy supply
	Internal market in natural gas 98/30/EC	Energy supply
	Ecodesign requirements for energy-using products 2005/32/EC	Energy consumption
	End-use efficiency and energy services 2006/32/EC	Energy consumption
	Eco-management & audit scheme (EMAS) EC 761/2001	Energy consumption
	Energy labelling for office equipment 2422/2001	Energy consumption
	Efficiency fluorescent lighting 2000/55/EC	Energy consumption
	Motor challenge, voluntary EC programme	Energy consumption
	Integrated European railway area (COM(2002)18 final)	Transport
	Marco Polo programme on freight transport	Transport
	HFCs in mobile air conditioning 2006/40/EC	Transport
	F-gas regulation (842/2006)	Industrial Process
	Rural development support and CAP(2603/1999, 1698/2005 and 1290/2005)	Agriculture
	Support scheme for energy crops under CAP (795/2004)	Agriculture
	Support for rural development from EAGGF (1257/1999)	Agriculture
	Pre-accession measures for agriculture and rural development (1268/1999)	Agriculture
	Nitrates directive 91/676/EEC	Agriculture
	Packaging and packaging waste (94/62/EC, 2004/12/EC, 2005/20/EC)	Waste
Directive on waste 2006/12/EC	Waste	

Source: MS responses to the CCPMs questionnaire, 2005. Personal communications.

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Sources of information

The UK's national report submitted to the European Commission under Article 3(2) of the Monitoring Mechanism, Decision 280/2004/EC. Report and template dated 31 May 2007.

Annual greenhouse gas inventory 1990 - 2006 and inventory report, 15 April 2008.

Energy White Paper, 2007, <http://www.berr.gov.uk/energy/whitepaper/page39534.html>

Base-year emissions from the UNFCCC website,
http://unfccc.int/ghg_data/kp_data_unfccc/base_year_data/items/4354.php

European Climate Change Programme (ECCP), Database on Policies and Measures in Europe <http://www.oeko.de/service/pam/index.php>

Kyoto base-year emissions

Kyoto base-year emissions are presented throughout, except Table 1 which presents projections reference year emissions (see below). Kyoto base year emissions of greenhouse gases were calculated using 1990 emissions for carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) and 1995 emissions for fluorinated gases (SF₆, HFCs and PFCs). These base-year emissions include emissions from LULUCF under Art. 3.7 of the Kyoto Protocol.

Kyoto base-year emissions have now been reviewed and set for all EEA countries.

Projections reference year emissions

Projections reference year emissions are presented in Table 1.

Projections reference year emissions are defined as projections-consistent emissions data for a given historic year, as chosen by the Member State. Inventory recalculations from year to year may mean that latest inventory data cannot be compared with projections based on older inventory data. Where such an inconsistency has arisen, MS projections have been corrected by applying the following formula, in Table 2:

Corrected projection = reported projections * latest inventory total GHG emissions / Table 1 reported total GHG emissions for the same reference year

Quality of Reporting

Member State reporting in the sources detailed above was assessed semi-qualitatively. Scoring was attributed according to the level of detail and clarity: from 0 (representing not

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reported) to +++ (representing very detailed and/or clear reporting). Guidance used for this assessment included the reporting requirements laid down in:

- EU legislation: Monitoring Mechanism (280/2004/EC) and Implementing Provisions (2005/166/EC)
- UNFCCC reporting guidelines for national communications available in English, French, Spanish (“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications - FCCC/CP/1999/7”)

The following tables detail reporting considered to be best practice for the purposes of this assessment.

Information provided	Example of good practice
Policy names	Clear names and description provided with unique identifier.
Objectives of policies	Good description of objectives
Types of policies	Type of policy instrument specified e.g. regulatory, fiscal
Which greenhouse gases?	Specifies which gases each PAM affects
Status of Implementation	Clear for each PAM: planned, adopted, implemented, expired
Implementation body	Clear which authorities are responsible for implementation
Quantitative assessment of emission reduction effect and cost of policies	Almost all PAMs are actually quantified. Total effect of all PAMs specified. WOM projection provided.
Interaction with other national and EU level policies	Detailed discussion and analysis of policy interactions.
Measures implementing community legislation	Report details which national policies are implementing individual pieces of EU legislation.
Arrangements for flexible mechanisms	Details arrangements for use of flexible mechanisms.
Balance between domestic action and flexible mechanisms	Regarding reductions required to meet Kyoto target, details proportion to result from domestic action and flexible mechanisms.

Category of Information	Example of good practice
Projection scenarios	"With Existing Measures" and "With Additional Measures" projections required, "without measures projection" optional.
Policies included in each projection	Clear presentation of the policies included in each projections scenario.
Expressed relative to historic reference year data	Projections are presented alongside consistent historic emissions.
Starting year	Starting year and emissions used as basis for projections is detailed.
Split of projections	Projection split by all 6 gases (or F-gases together), all sectors and years
Presentation of results	Clear, both tables and graphs provided and/or used excel reporting template.
Description of methodologies	Description of approach, model and assumptions
Sensitivity analysis	Was an analysis carried out to determine the sensitivity of projections to variance in the input parameters? Are high medium and low scenarios presented?
Discussion of uncertainty	Is an uncertainty range for the projections provided?
Details of parameters and assumptions	Are parameters as required under Monitoring Mechanism 280/2004/EC reported?

Indicators for projections	Are indicators for projections as required under Monitoring Mechanism 280/2004/EC reported?
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Table 9. Information provided on policies and Kyoto flexible mechanisms

Information provided	Level of information provided	Comments
Policy names	+++	Clear description given
Objectives of policies	+++	Clear description given
Types of policies		
Which greenhouse gases?	+++	Specified for each PAM
Status of Implementation	++	Mostly clear but several "With Existing Measures" PAMs have "planned" status.
Implementation body	++	Described for most PAMs
Quantitative assessment of emission reduction effect and cost of policies	+++	All PAMs quantified.
Interaction with other national and EU level policies	++	Not discussed but provides a total effect of all PAMs together, to take account of interactions.
Measures implementing community legislation	+++	Good information in template.
Arrangements for flexible mechanisms	+++	Clear
Balance between domestic action and flexible mechanisms	+++	Clear

Table 10. Information provided on projections

Category of Information	Level of information provided	Comments
Projection scenarios	++	'With Existing Measures' projection. Two policies and measures given as 'With Additional Measures' (WAM) although there was no WAM projection scenario available.
Policies included in each projection	+++	Clear
Expressed relative to base year	+++	Clear base years (1995 for F-gases, 1990 for other gases)
Starting year	+++	2005 from 2007 inventory
Split of projections	+++	By all 6 gases and all sectors as per CRF sector split
Presentation of results	+++	Results provided in Excel template
Description of methodologies (approach, model and assumptions)	+++	Clear description
Sensitivity analysis	+	Some indication of model key inputs and uncertainties
Discussion of uncertainty	++	Uncertainty range provided (MtCO ₂ -eq. per year)
Details of parameters and assumptions	++	Most parameters provided.
Indicators for projections	++	Most indicators provided.

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The Monitoring Mechanism submission and accompanying Excel template, submitted in May 2007, provided good description and quantification of policies and measures – all were quantified individually and cumulatively.

The projections were also clearly and comprehensively reported, with a split of projections by the six greenhouse gases and by sectors according to the Common Reporting Format (CRF). However the situation regarding emissions reductions from the ETS 2008-2012 was not entirely clear from the report and was subsequently clarified in personal communications with UK Defra.

Most projection indicators and parameters were provided. Limited information was provided about model sensitivity and uncertainty.

Parameters for projections are presented in Table 10. Almost all the mandatory parameters are provided for the base year, 2005, 2010, 2015 and 2020 although some are given in a different format. Of the recommended parameters, only general economic and energy sectors values are reported.

Table 11. Parameters for Projections

1. Mandatory parameters on projections	Base Year	2005	2010	2015	2020
Assumptions for general economic parameters					
GDP (Mio Euro 2000 basis)	1230755	1765268	2022122	2287846	2588487
GDP (annual growth rate)	78.38	112.25	127.93	144.74	163.76
Population (Thousand people)	57237	60217950	61619.29	63016.25	64449.07
Population (% of 2005 value)	95.05	100.00	102.33	104.65	107.03
International coal prices (Euro per GJ ¹)	2.58	1.25	1.01	0.97	0.93
International oil prices (Euro per bbl ¹)	18.86	28.61	20.81	22.11	23.41
International gas prices (Euro per GJ ¹)	2.07	3.70	3.03	3.17	3.30
Assumptions for the energy sector					
Total gross inland consumption (PJ)	8745.44	9547.08	9410.72	9494.41	9298.98
Oil (Fossil)	3751.00	3731.12	3702.01	3777.87	3823.15
Gas (Fossil)	2144.00	3948.93	3898.23	4233.15	4240.82
Coal	2804.44	1673.35	1496.17	1091.42	867.21
Renewable	46.00	193.68	314.31	391.97	367.80
Nuclear (IEA definition for energy calc.)	681.07	769.45	708.21	320.39	368.97
Net electricity import (-+)	43.02	24.29	41.63	54.41	54.41
Total electricity production by fuel type	224000.00	279900.00	276079.60	335160.80	367145.20
Oil (Fossil)	15000.00	1900.00	2554.13	2163.72	1520.51
Gas (Fossil)	0.00	134800.00	121609.30	163698.90	219069.60
Coal	204000.00	126100.00	118852.37	116293.38	93511.09
Renewable	5000.00	17100.00	33063.80	53004.80	53044.00
Nuclear (IEA definition for energy calc.)	59000.00	75200.00	72538.50	33624.40	25845.50
Net electricity import (-+)	43.02	24.29	41.63	54.41	54.41

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Total electricity production by fuel type	224000.00	279900.00	276079.60	335160.80	367145.20
Oil (Fossil)	15000.00	1900.00	2554.13	2163.72	1520.51
Gas (Fossil)	0.00	134800.00	121609.30	163698.90	219069.60
Coal	204000.00	126100.00	118852.37	116293.38	93511.09
Renewable	5000.00	17100.00	33063.80	53004.80	53044.00
Nuclear (IEA definition for energy calc.)	59000.00	75200.00	72538.50	33624.40	25845.50
Other ²	14000.00	13800.00	13769.95	13770.00	13767.90
Energy demand by sector split by fuel	5296.30	5576.40	5563.84	5743.03	5877.43
Industry	1410.11	1207.05	1258.97	1292.05	1337.68
Oil (Fossil)	374.30	285.54	290.98	288.47	286.80
Gas (Fossil)	555.17	594.94	599.97	634.72	679.52
Coal	480.64	317.78	359.23	360.06	362.58
Renewable	0.00	8.79	8.79	8.79	8.79
Commercial (Tertiary)	504.93	450.08	429.15	446.31	461.80
Oil (Fossil)	150.72	44.38	38.94	38.10	38.10
Gas (Fossil)	312.75	401.10	384.77	400.68	414.91
Coal	41.45	2.09	1.67	1.67	1.67
Renewable	0.00	2.51	3.77	5.86	7.12
Residential	1359.45	1535.30	1368.66	1380.81	1404.25
Oil (Fossil)	103.83	129.37	113.88	102.58	92.95
Gas (Fossil)	1081.45	1357.78	1229.24	1258.55	1295.40
Coal	174.17	43.54	20.93	15.07	11.30
Renewable	0.00	4.61	4.61	4.61	4.61
Transport	2021.81	2383.96	2507.06	2623.87	2673.69
Oil (Fossil)	1937.23	2299.39	2422.48	2539.29	2589.12
Gas (Fossil)	0.00	0.00	0.00	0.00	0.00
Renewable	84.57	84.57	84.57	84.57	84.57
Assumptions on weather parameters					
Heating Degree Days	NE	2105	2075	2045	2015
Cooling Degree Days	72.06	72.48	77.59	82.69	87.80
Assumptions for the industry sector					
The share of the industrial sector in GDP and growth rate					
Gross value-added total industry (Bio Euro)	NE	242553.94	304142.23	363905.59	436635.05
The production index for industrial sector ³					
PAP (paper only exc pulp)	74.35	91.33	100.12	106.56	112.82
I&S (iron and steel industry)	117.72	87.40	110.94	112.47	112.93
NFM (non ferrous metals)	94.58	118.80	125.45	129.41	132.85
FDT(food drink and tobacco)	96.12	103.95	106.57	110.42	113.98
TLC (textiles leather and clothing)	139.81	70.64	56.54	46.38	37.86
CHEM Chemicals & Man-made Fibres	73.05	111.65	127.04	147.14	169.61
MIN Other Non-metallic Minerals	109.92	109.51	116.97	122.86	128.71
ENGV Engineering & vehicles	94.33	93.07	103.24	110.50	118.18
COI DTI 'Other industry' category	100.90	109.89	120.25	128.71	137.83
Assumptions for the transport sector					
For Member States using macroeconomic models:					
The growth of transport relative to GDP	NE	NE	NE	NE	NE
For Member States using other models:					
The growth of passenger person kilometres (Million passenger km) ⁴	678365.94	777536.06	889225.97	911714.90	938851.03
Number of kilometers by passenger cars (Mkm)	343054.20	418880.73	484674.32	497568.83	513252.70

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The growth of freight tonne kilometres	142341.75	183922.86	197210.70	214912.07	228149.23
Freight transport ⁵ (all modes) (Mtkm)	142341.75	183922.86	197210.70	214912.07	228149.23
Assumptions for buildings (in residential and commercial or tertiary sector)					
Gross value-added - services (Bio Euro) (EC95)	NE	810.38	943.89	1063.11	1188.59
For Member States using macroeconomic models:					
The level of private consumption (excluding private transport)	NE	NE	NE	NE	NE
The share of the tertiary sector in GDP and the growth rate	NE	NE	NE	NE	NE
For Member States using other models:					
The rate of change of floor space for tertiary buildings and dwellings					
Number of occupants per dwelling	2.54	2.33	2.27	2.21	2.16
Average floor space per employee (m ² /employee)	27.44	28.65	29.70	29.75	29.87
The number of dwellings and number of employees in the tertiary sector					
The number of dwellings (1000 dwellings)	22939.00	26241.23	27634.12	29086.29	30500.00
Number of employees in the tertiary sector (1000 employees)	20331.00	24456.75	26096.99	27220.93	28474.99
Assumptions in the agriculture sector					
For Member States using macroeconomic models:					
The share of the agriculture sector in GDP and relative growth	NA	NA	NA	NA	NA
For Member States using other models:					
Livestock numbers by animal type (1000 heads)					
Total Cattle	12124.65	10690.61	8287.89	8287.89	8287.89
Dairy cattle	2863.89	2090.82	1996.52	1996.52	1996.52
Non-dairy cattle	9260.76	8599.79	6291.37	6291.37	6291.37
sheep	45361.15	36134.41	35957.03	35957.03	35957.03
swine	7552.99	5143.04	5117.33	5117.33	5117.33
poultry	136888.94	170576.78	170576.78	170576.78	170576.78
The area of crops by crop type					
Fertilizer used (Synthetic & Manure) (kt Nitrogen)	1634.00	1280.78	1261.45	1242.13	1222.80
Emissions factors by type of livestock for enteric fermentation and manure management (t CO ₂ e/Thousand heads)					
enteric fermentation Dairy cattle	1849.01	2148.75	2148.75	2148.75	2148.75
enteric fermentation Non-dairy cattle	890.36	900.92	900.92	900.92	900.92
enteric fermentation sheep	97.90	100.85	100.85	100.85	100.85
manure management Dairy cattle	454.15	526.33	526.33	526.33	526.33
manure management Non-dairy cattle	88.89	88.67	88.67	88.67	88.67
manure management sheep	2.33	2.40	2.40	2.40	2.40
manure management Swine	63.00	63.00	63.00	63.00	63.00
manure management Poultry	1.64	1.64	1.64	1.64	1.64
fertilizer use & Crops					
Synthetic fertilizers (kg N ₂ O-N/kg N)	0.0125	0.0125	0.0125	0.0125	0.0125
Manure (kg N ₂ O-N/kg N)	0.0125	0.0125	0.0125	0.0125	0.0125
All crop types (t N ₂ O per t N applied)	0.0125	0.0125	0.0125	0.0125	0.0125

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Assumptions in the waste sector ⁵					
Municipal solid waste (kt)	38595.87	44183.72	49600.24	55417.16	
The organic fractions of municipal solid waste (%)	63.36%	63.36%	63.36%	63.43%	
Municipal solid waste disposed to:					
Landfills	62.63%	28.21%	13.15%	7.61%	
Incinerated	9.31%	20.75%	20.40%	20.63%	
Composted	6.61%	24.05%	32.13%	33.61%	
Landfills (kt)	24170.96	12462.13	6524.90	4220.00	
Assumptions in the forestry sector					
Forest definitions	Land spanning more than 0.1 hectares with trees higher than 5 meters				
	and a canopy cover of more than 20 % or trees able to reach				
	the set thresholds in situ				
Areas of:					
managed forests		1651000	1718000	1785000	1852000
unmanaged forests		822000	822000	822000	822000

Footnotes:

¹ 1990 real prices, taking 2006 exchange rate

² Includes imported electricity and gross pumped storage output

³ Index, 2000 base year

⁴ Road only - estimates for other modes not available

⁵ Taken from LAWRD model

2. Recommended parameters on projections	2005	2010	2015	2020
Assumptions for general economic parameters				
GDP growth rates split by industrial sectors in relation to 2000				
PAP (paper only exc pulp)	91.33	100.12	106.56	112.82
I&S (iron and steel industry)	87.40	110.94	112.47	112.93
NFM (non ferrous metals)	118.80	125.45	129.41	132.85
FDT(food drink and tobacco)	103.95	106.57	110.42	113.98
TLC (textiles leather and clothing)	70.64	56.54	46.38	37.86
CHEM Chemicals & Man-made Fibres	111.65	127.04	147.14	169.61
MIN Other Non-metallic Minerals	109.51	116.97	122.86	128.71
ENGV Engineering & vehicles	93.07	103.24	110.50	118.18
COI DTI 'Other industry' category	109.89	120.25	128.71	137.83
Comparison projected data with official forecasts				
Assumptions for the energy sector				
Average domestic sector gas euros/therm(euro 2000	0.84	0.98	1.00	1.02

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2. Recommended parameters on projections	2005	2010	2015	2020
basis)				
Domestic solid fuel prices euros/therm (euro 2000 basis)	0.95	0.92	0.91	0.91
Domestic burning oil euros/therm (euro 2000 basis)	0.99	0.67	0.70	0.73
Gas to industrial users euros/therm (euro 2000 basis)	0.77	0.61	0.64	0.66
Coal to industrial users euros/therm (euro 2000 basis)	0.29	0.26	0.25	0.24
Fuel oil to industrial users euros/therm (euro 2000 basis)	0.95	0.74	0.77	0.81
Gas to public and miscellaneous sector euros/therm (euro 2000 basis)	0.87	0.77	0.80	0.82
price of coal to service sector euros/therm (euro 2000 basis)	0.37	0.32	0.32	0.31
price of gasoil to the service sector euros/therm (euro 2000 basis)	1.11	0.76	0.79	0.83
National electricity prices per sector as above (may be model output)				
Price of electricity for industrial sector euros/therm (euro 2000 basis)	1.75	1.86	1.86	1.86
Price of electricity for domestic sector euros/therm (euro 2000 basis)	3.64	3.75	3.75	3.75
Price of electricity for service sector euros/therm (euro 2000 basis)	2.05	2.16	2.16	2.16
National coal, oil and gas energy prices per sector (including taxes)				
National electricity prices per sector as above (may be model output)				
Total production of district heating by fuel type				
Assumptions for the industry sector				
Assumptions fluorinated gases:				
Aluminium production and emissions factors				
Magnesium production and emissions factors				
Foam production and emissions factors				
Stock of refrigerant and leakage rates				
<i>For Member States using macroeconomic models:</i>				
Share of GDP for different sectors and growth rates				
Rate of improvement of energy intensity (1990 = 100)				
<i>For Member States using other models:</i>				
Index of production for different sectors				
Rate of improvement or index of energy efficiency				
Assumptions for buildings (in residential and commercial / tertiary sector)				
<i>For Member States using macroeconomic models:</i>				
Share of tertiary and household sectors in GDP				
Rate of improvement of energy intensity				
<i>For Member States using other models:</i>				
Number of households				
Number of new buildings				
Rate of improvement of energy efficiency (1990 = 100)				

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2. Recommended parameters on projections	2005	2010	2015	2020
Assumptions for the transport sector				
<i>For Member States using econometric models:</i>				
Growth of transport relative to GDP split by passenger and freight				
Improvements in energy efficiency split by vehicle type				
Improvements in energy efficiency split by vehicle type, whole fleet/new cars				
Rate of change of modal split (passenger and freight)				
Growth of passenger road kilometres				
Growth of passenger rail kilometres				
Growth of passenger aviation kilometres				
Growth of freight tonne kilometres on road				
Growth of freight tonne kilometres by rail				
Growth of freight tonne kilometres by navigation				
Assumptions for the agriculture sector				
<i>For Member States using econometric models:</i>				
Agricultural trade (import/export)				
Domestic consumption (e.g. milk/beef consumption)				
<i>For Member States using other models:</i>				
Development of area of crops, grassland, arable, set-aside, conversion to forests etc				
Macroeconomic assumptions behind projections of agricultural activity				
Description of livestock (e.g. by nutrient balance, output/animal production, milk production)				
Development of farming types (e.g. intensive conventional, organic farming)				
Distribution of housing/grazing systems and housing/grazing period				
Parameters of fertiliser regime:				
Details of fertiliser use (type of fertiliser, timing of application, inorganic/organic ratio)				
Volatilisation rate of ammonia, following spreading of manure on the soil				
Efficiency of manure use				
Parameters of manure management system:				
Distribution of storage facilities (e.g. with or without cover):				
Nitrogen excretion rate of manures				
Methods of application of manure				
Extent of introduction of control measures (storage systems, manure application), use of best available techniques				
Parameters related to nitrous oxide emissions from agricultural soils				
Amount of manure treatment				