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Accompanying the document

REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL
PROGRESS TOWARDS ACHIEVING THE KYOTO OBJECTIVES
(required under Article 5 of Decision 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol)

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1. DETAILED ANALYSIS OF EMISSION TRENDS IN THE MAIN SECTORS

1.1. Energy supply and use, excluding transport

Table 1: GHG emissions from energy supply and use, excluding transport (1990-2009)

GHG emissions	Share in 1990 total GHG	Share in 2009 total GHG	Change 1990-2009	Change 2000-2009
EU-15	60.5%	58.1%	-16.2%	-10.9%
EU-27	62.8%	59.1%	-22.3%	-11.2%

- Total GHG emissions **from energy supply and use** decreased in the period 1990-2009 by 16.2% in EU-15 and by 22.3% in EU-27.

- Energy, responsible for about 60%, is the largest sector in terms of GHG emissions in the EU.

- CO_2 emissions from **electricity and heat production** is the largest key source in the EU-15 accounting for 23.9% of total greenhouse gas emissions in 2009 and for 84 % of greenhouse gas emissions of the energy industries sector. Between 1990 and 2009, CO_2 emissions from electricity and heat production decreased by 6 % in the EU-15. Differences in the intensity of greenhouse gas emissions of heat and electricity production between the Member States are to a large extent explained by the mix of fuels.

- CO_2 emissions from public electricity and heat production did not increase in line with fuel consumption. The main explanatory factors at the EU-15 level during the past 19 years are fuel switching from coal to gas and improvements in energy efficiency.

- Between 1990 and 2009 in the EU-15, greenhouse gas emissions from **energy industries** increased in eight Member States and fell in seven. The highest absolute increase was accounted for by Spain, the Netherlands and Greece. Germany and the UK account for the largest part of reductions.

- The decoupling of fuel combustion and greenhouse gas emissions is also observed in the EU-27. The reduction in the use of coal for heat and power generation in the EU-27 accounted for two thirds of the net reduction in emissions from energy industries. Despite the economic crisis, the use of biomass for heat and power increased significantly in 2009 and continued the upward trend observed since 1990. Less fossil fuel, particularly coal, and more combustible renewables (i.e. biomass) explain why this sector emitted around100 Mt of CO_2 less than in 2008.

1.2. Transport

Table 2: GHG emissions from transport (1990-2009)

GHG emissions	Share in 1990 total GHG	Share in 2009 total GHG	Change 1990-2009	Change 2000-2009
EU-15	16.3%	21.8%	16.8%	-2.0%
EU-27	13.8%	20.2%	20.8%	2.2%

- Between1990-2009 total GHG emissions from **transport** increased by 16.8% in the EU-15 and by 20.8% in the EU-27. The trend of greenhouse gas emissions follows closely the trend of fuel combustion.

- CO_2 emissions from **road transport** is the second largest key source of all categories in the EU-15. Between 1990 and 2009, CO_2 emissions from road transportation increased by 18 % in the EU-15. The emissions from this key source are due to fossil fuel consumption in road transport, which increased by 17.4 % between 1990 and 2009.

- In the EU-15 Germany, France, Italy, Spain and the United Kingdom contributed most to the CO_2 emissions from road transport (76.1 %). All Member States, except for Germany (-4%), increased emissions from road transportation between 1990 and 2009. The Member States with the highest increases in absolute terms were Spain, Italy, France and Greece. The countries with the lowest increase in relative terms were Finland, France, Sweden and the United Kingdom.

- Between 2008 and 2009 the total emissions from **road transport** decreased in the EU-15 as well as in EU-27. However, CO_2 emissions from gasoline increased in the majority of EU-12 Member States, decreases were noted in Bulgaria, Hungary, Poland, Romania and Slovenia. CO_2 emissions from diesel oil increased slightly in Germany, Greece and all EU-12 except for Bulgaria and Malta.

- CO_2 emissions from **civil aviati**on (covering emissions from civil domestic passenger and freight traffic that departs and arrives in the same country, including take-offs and landings for these flight stages) account for 2.1% of total transport-related GHG emissions in 2009 (EU-15). Between 1990 and 2009, CO_2 emissions from civil aviation increased by 25 % in the EU-15 and by 23% in the EU-27.

1.3. Agriculture

Table 3: GHG emissions from agriculture (1990-2009)

GHG emission	Share in 1990 total GHG	Share in 2009 total GHG	Change 1990-2009	Change 2000-2009
EU-15	10.3%	10.2%	-14.1%	-9.6%
EU-27	10.9%	10.3%	-22.0%	-7.5%

- In 2009, total EU-15 greenhouse gas emissions from **agriculture** were 14.1 % below 1990 levels. In the EU-27 emissions were 22.0 % below 1990 levels.

- Agriculture contributes 10.2 % to total EU-15 GHG emissions, making it the second largest sector. The most important GHGs from agriculture are N_2O and CH_4 accounting for 5.6 % and 4.5 % of the total GHG emissions respectively.

- **Enteric fermentation from cattle** is the largest single source of CH_4 emissions in the EU-15 accounting for 2.8 % of total GHG emissions in 2009. Between 1990 and 2009, CH_4 emissions from enteric fermentation from cattle declined by 12 % in the EU-15. In 2009, the emissions were at the level of 2008.

- N_2O emissions from **agricultural soils** account for 5 % of total GHG emissions. N_2O emissions from this source decreased by 18 % between 1990 and 2009. All EU-15 Member States decreased emissions. The main driving force of direct N_2O emissions from agricultural soils is the use of nitrogen fertiliser and animal manure, which were in 2009 31 % and 10 % below 1990 levels, respectively.

- The decrease in emissions is largely a consequence of efficiency improvements (in particular more efficient fertiliser use and increased animal productivity) and the reform of the EU common agricultural policy (CAP) decoupling direct support from production, strengthening the link to environmental legislation (cross-compliance), introducing climate change objectives into the CAP (under the Health Check Reform) and increasing support to climate friendly measures included in agri-environmental programmes. Further, the implementation of the Nitrates Directive has been enhanced.

1.4. Industrial processes

Table 4: GHG emissions from industrial processes (1990-2009)

GHG emissions	Share in 1990 total GHG	Share in 2009 total GHG	Change 1990-2009	Change 2000-2009
EU-15	8.3%	6.7%	-29.1%	-19.0%
EU-27	8.3%	7.0%	-30.8%	-18.0%

- Total EU-15 greenhouse gas emissions **from industry** were 29.1 % below 1990 levels in 2009. In the EU-27 emissions were 30.8 % below 1990 emissions in 2009.

- **Industrial processes** is the third largest sector contributing 7 % to total EU-15 GHG emissions in 2009. The most important GHGs from this sector are CO_2 (4.1 % of total GHG emissions), HFCs (1.8 %) and N_2O (0.6 %).

- In 2009, the emissions decreased by 13.8 % compared to 2008, to a large extent as a consequence of the economic recession. This large decline in 2009 was driven by reductions in cement production and iron and steel production.

- CO_2 emissions from **mineral products** decreased by 19 %, especially since 2008 mainly driven by the decrease in cement production. Only four EU-15 Member States increased their CO_2 emissions between 1990 and 2009 (Ireland, the Netherlands, Portugal and Sweden). Ireland had the largest emission increases in absolute terms and France the largest absolute emission reductions in the period 1990-2009.

- CO_2 emissions in the United Kingdom decreased considerably during 2007 and 2008 due to a decrease in cement production in that period. This decrease proceeded in 2009 due to the recent economic downturn. The decrease in clinker production of -21 % as a consequence of the impact of the economic recession was also the reason for the reduction of emissions in Spain. Italy, having the highest share in the EU-15 emissions, also had a strong reduction in CO_2 emissions during 2008 and 2009 due to the decrease in clinker production of about 19 %.

- Between 1990 and 2009, CO_2 emission from **metal production** decreased by 52 %. The largest absolute decreases were in Germany, Italy and the Netherlands. Emissions from

iron and steel production decreased by 35% between 2008 and 2009 which was mainly due to the economic recession.

- HFC emissions from **consumption of halocarbons and SF_6** account for 1.7 % of total EU-15 GHG emissions in 2009. HFC emissions in 2009 were 95 times higher than in 1990. The main reason for this is the phase-out of ozone-depleting substances such as chlorofluorocarbons under the Montreal Protocol and the replacement of these substances with HFCs. Germany, France, UK, Austria and Spain are responsible for 84 % of total EU-15 emissions from this source.

1.5. Waste management

Table 5: GHG emissions from waste management (1990-2009)

GHG emission	Share in 1990 total GHG	Share in 2009 total GHG	Change 1990-2009	Change 2000-2009
EU-15	4.3%	3.0%	-38.8%	-23.9%
EU-27	3.8%	3.2%	-31.6%	-19.4%

- In 2009 total EU-15 greenhouse gas emissions from **waste** were 38.8% below 1990 levels and 31.6% below 1990 in EU-27.

- Waste is the fourth largest sector in the EU-15, contributing around 3% to total GHG emissions. In 2009, emissions decreased by 3 % compared to 2008.

- CH_4 emissions from from **solid waste** disposal on land decreased by 45 % between 1990 and 2009 in the EU-15. The majority of EU-15 Member States reduced their emissions from this source; however France, Greece, Portugal and Spain did not.

- Between 1990 and 2009, CH_4 emissions from **managed landfills** declined by 45 % in the EU-15. In 2009, CH_4 emissions from landfills decreased by 3 % compared to 2008. A main driving force of CH_4 emissions from managed waste disposal on land is the amount of biodegradable waste going to landfills. Total municipal waste disposal on land declined by 33 % between 1990 and 2009. In addition, CH_4 emissions from landfills are influenced by the amount of CH_4 recovered through flaring and utilisation. The share of CH_4 recovery increased in all EU-15 Member States between 1990 and 2009.

- The Member States with most emissions from **managed waste disposal on land** in 2009 were France, the UK, Italy and Spain. These MS account for 70 % of EU-15 emissions in this year. The largest reductions in absolute terms during 1990 and 2009 were reported by the UK and Germany. The emission reductions are partly due to the (early) implementation of the landfill directive or similar legislation in the Member States.

2. GHG EMISSIONS IN THE EU CANDIDATE COUNTRIES

The Republic of Croatia is a Party to the UNFCCC from April 1996 and ratified the Kyoto Protocol in May 2007 committing to a 5% reduction of GHG compared to the base year (1990)[14]. Between 1990 and 2009 Croatia's GHG emissions decreased by 8% and comparing to 2008 decreased by 7% to large extend being the effect of the economic recession. CO_2 emissions per capita are at 6.5 tons and CO_2 intensity of GDP is around the double of that of the EU. According to GHG emission projections included in the 5th National Communication,

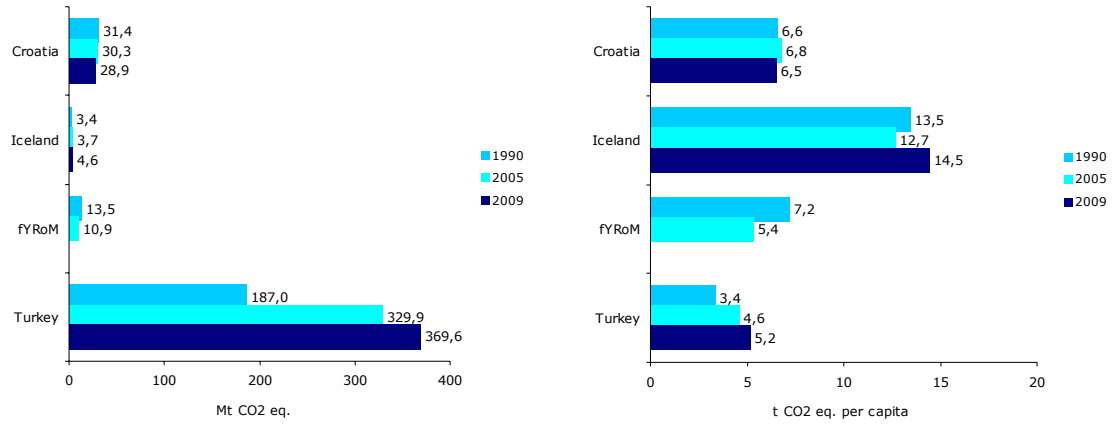
Croatia may to face difficulties with achieving its Kyoto target with the current set of policies and measures.

Iceland ratified the UNFCCC in June 1993 and the Kyoto Protocol in May 2002 committing itself to keep the increase of GHG emissions within 10% compared to the base year (1990). Iceland's GHG emissions between 1990 and 2009 increased by 35% and in 2009 were 5.4%% lower than in 2008 which reflects the impact of the economic recession. CO_2 emissions per capita are at 14.5 tons and CO_2 intensity of GDP is around 20% higher than in the EU. According to latest projections included in the 5th National Communication and taking into account decision 14/CP.7 (allowing Iceland to exclude emission from the heavy industry from the commitment level under the Kyoto Protocol in the period 2008-2012), Iceland is on track to meet its Kyoto target.

Turkey became an Annex I Party to the UNFCCC in May 2004 and ratified the Kyoto Protocol in May 2009 (however has no GHG limitation/reduction commitment). Turkey's first National Communication to the UNFCCC was submitted in January 2007. According to the recent GHG inventory, in 2009 Turkey's emissions amounted to 369.6 $MtCO_2$-eq, so an increase of 97.6% was noted compared to 187 $MtCO_2$-eq. in 1990. The emissions also increased between 2008 and 2009, by around 1%. Between 1990 and 2009, per capita GHG emissions have increased in Turkey. However, at 5.2 tonnes, the per capita emissions in Turkey are about half of the average EU-27 per capita emissions. Turkey's emissions intensity doubled between1990-2009, whereas in EU-27 emissions per GDP decreased by 40% over that period.

The former Yugoslav Republic of Macedonia (fYRoM) became a Party to UNFCCC in January 1998 and ratified the Kyoto Protocol in November 2004. FYRoM is considered a developing country under the Convention and its Protocol. In January 2009 the fYRoM submitted to the UNFCCC secretariat its 2nd National Communication, including inventory of GHG emissions from 1990-2002. According to available data for 2005, total GHG emissions decreased by around 19% since 1990. Currently CO_2 emissions per capita are at level of 5.4 ton and GDP per capita amounted to 2300 € in 2005. Currently, there is no information on GHG projections available for the former Yugoslav Republic of Macedonia.

Figure 1: GHG total emissions and emissions per capita in the EU candidate countries



Note: no 2009 data available for fYRoM, 2005 data come from the EDGAR v4.1 (2010) database
Source: UNFCCC submissions, EDGAR database (see: http://edgar.jrc.ec.europa.eu/index.php)

Table 6: GHG emissions in CO_2 equivalents (excl. LULUCF) and Kyoto Protocol targets for 2008–12

Country	1990	Base year (1)	GHG emissions 2009	Change 2008-2009	Change 2009 relative to base year	EU burden-sharing or Kyoto target	EU burden-sharing or Kyoto target
	Mt CO2eq	Mt CO2eq	Mt CO2eq	%	%	%	Mt CO2eq
Austria	78,2	79,0	80,1	-7,9%	1,3%	-13,0%	68,8
Belgium	143,3	145,7	124,4	-7,9%	-14,6%	-7,5%	134,8
Bulgaria	111,4	132,6	59,5	-13,8%	-55,1%	-8,0%	122,0
Cyprus (4)	5,3	no target	9,4	-7,7%	no target	no target	no target
Czech Republic	195,5	194,2	132,9	-5,8%	-31,6%	-8,0%	178,7
Denmark (3)	68,0	69,3	61,0	-4,2%	-12,0%	-21,0%	55,8
Estonia	41,1	42,6	16,8	-16,1%	-60,5%	-8,0%	39,2
Finland	70,4	71,0	66,3	-5,8%	-6,6%	0,0%	71,0
France	562,9	563,9	517,2	-4,1%	-8,3%	0,0%	563,9
Germany	1247,9	1232,4	919,7	-6,3%	-25,4%	-21,0%	973,6
Greece	104,4	107,0	122,5	-4,7%	14,5%	25,0%	133,7
Hungary	96,8	115,4	66,7	-8,7%	-42,2%	-6,0%	108,5
Ireland	54,8	55,6	62,4	-8,0%	12,2%	13,0%	62,8
Italy	519,2	516,9	491,1	-9,3%	-5,0%	-6,5%	483,3
Latvia	26,6	25,9	10,7	-10,0%	-58,6%	-8,0%	23,8
Lithuania	49,6	49,4	21,6	-10,1%	-56,3%	-8,0%	45,5
Luxembourg	12,8	13,2	11,7	-4,7%	-11,3%	-28,0%	9,5
Malta (4)	2,1	no target	2,9	-4,7%	no target	no target	no target
Netherlands	211,9	213,0	198,9	-2,8%	-6,6%	-6,0%	200,3
Poland	452,9	563,4	376,7	-4,8%	-33,2%	-6,0%	529,6
Portugal	59,4	60,1	74,6	-4,3%	24,0%	27,0%	76,4
Romania	250,1	278,2	130,8	-14,7%	-53,0%	-8,0%	256,0
Slovakia	74,1	72,1	43,4	-9,9%	-39,8%	-8,0%	66,3
Slovenia	18,5	20,4	19,3	-9,1%	-5,0%	-8,0%	18,7
Spain	283,2	289,8	367,5	-9,2%	26,8%	15,0%	333,2
Sweden	72,5	72,2	60,0	-5,6%	-16,9%	4,0%	75,0
United Kingdom	776,1	776,3	566,2	-8,7%	-27,1%	-12,5%	679,3
EU-15	**4264,9**	**4265,5**	**3723,7**	**-6,9%**	**-12,7%**	**-8,0%**	**3924,3**
EU-27 (2)	**5588,8**	**5767,2**	**4614,5**	**-7,1%**	**-20,0%**	**no target**	**no target**

Notes:

(1) For EU-15 the base year for carbon dioxide, methane and nitrous oxide is 1990; for the fluorinated gases 12 Member States have selected 1995 as the base year, whereas Austria, France and Italy have chosen 1990. As the EU-15 inventory is the sum of Member States' inventories, the EU-15 base year estimates for fluorinated gas emissions are the sum of 1995 emissions for 12 Member States and 1990 emissions for Austria, France and Italy. The EU-15 base year emissions also include emissions from deforestation for the Netherlands, Portugal and the UK. The base year for carbon dioxide, methane and nitrous oxide for Bulgaria is 1988, for Hungary is the average of 1985-1987, for Slovenia 1986, for Poland 1988, for Romania 1989; for the fluorinated gases Slovakia has chosen 1990 as the base year and Romania 1989 all other central and eastern European members states have selected 1995.
(2) EU-27 does not have a common Kyoto Protocol target.
(3) The target includes a base-year compensation of 1 million AAU per year as agreed under the Decision 2010/778/EU (OJ 16.12.2010 L332/41)
(4)Malta and Cyprus do not have Kyoto targets.
(5) 2009 data has not yet been reviewed by the UNFCCC.

Table 7a: Kyoto targets for non-ETS sectors for 2008–2012, compared with emission projections

Member State	Base-year emissions (BY)	Kyoto or burden-sharing target		Total allowed emissions of non-ETS sectors (approxi-mation)	Projections of non-ETS emissions with existing measures			Projections of non-ETS emissions with additional measures			Removals (-) or emissions (+) from carbon sink activities		Use of Kyoto mechanisms at government level		Projections of non-ETS emissions with existing measures, with carbon sinks and use of Kyoto mechanisms			Projections of non-ETS emissions with additional measures, with carbon sinks and use of Kyoto mechanisms		
				Annual average 2008-2012	Annual average 2008-2012	Gap between projections and target		Annual average 2008-2012	Gap between projections and target		Annual average 2008-2012		Annual average 2008-2012		Annual average 2008-2012	Gap between projections and target		Annual average 2008-2012	Gap between projections and target	
	Mt CO_2-eq.	Mt CO_2-eq.	% change from BY	Mt CO_2-eq.	Mt CO_2-eq.	Mt CO_2-eq.	% of BY emissions	Mt CO_2-eq.	Mt CO_2-eq.	% of BY emissions	Mt CO_2-eq.	% of BY emissions	Mt CO_2-eq.	% of BY emissions	Mt CO_2-eq.	Mt CO_2-eq.	% of BY emissions	Mt CO_2-eq.	Mt CO_2-eq.	% of BY emissions
Austria	79.0	68.8	-13.0%	38.0	54.3	16.2	20.5%	53.7	15.6	19.7%	-0.7	-0.9%	-9.0	-11.4%	44.6	6.5	8.3%	44.0	5.9	7.5%
Belgium	145.7	134.8	-7.5%	76.3	79.8	3.5	2.4%	79.1	2.8	1.9%		0.0%	-6.3	-4.3%	73.6	-2.7	-1.9%	72.8	-3.5	-2.4%
Bulgaria (3)	132.6	122.0	-8.0%	83.9	29.1	-54.8	-41.3%	29.1	-54.8	-41.3%		0.0%	1.4	1.1%	30.5	-53.4	-40.3%	30.5	-53.4	-40.3%
Cyprus (2)	5.3	no target	no target	n.a.	5.2	na	na	5.1	na	na		na		na	5.2	na	na	5.1	na	na
Czech Republic	194.2	178.7	-8.0%	92.0	58.6	-33.3	-17.2%	58.5	-33.5	-17.2%	-1.2	-0.6%	25.0	12.9%	82.5	-9.5	-4.9%	82.3	-9.6	-5.0%
Denmark (4)	69.3	55.8	-21.0%	31.3	35.5	4.2	6.1%	35.3	4.0	5.8%	-1.6	-2.4%	-3.7	-5.3%	30.1	-1.1	-1.6%	30.0	-1.3	-1.9%
Estonia	42.6	39.2	-8.0%	27.4	6.2	-21.2	-49.6%	6.2	-21.2	-49.7%		0.0%	1.2	2.8%	7.4	-20.0	-46.8%	7.4	-20.0	-46.9%
Finland	71.0	71.0	0.0%	33.4	32.9	-0.5	-0.7%	32.8	-0.6	-0.9%	-0.6	-0.8%	-1.0	-1.4%	31.3	-2.1	-3.0%	31.2	-2.2	-3.1%
France	563.9	563.9	0.0%	431.9	393.2	-38.7	-6.9%	388.8	-43.1	-7.6%	-3.2	-0.6%	0.0	0.0%	390.0	-42.0	-7.4%	385.6	-46.4	-8.2%
Germany	1,232.4	973.6	-21.0%	522.1	497.7	-24.4	-2.0%	487.2	-34.9	-2.8%	-4.5	-0.4%	0.0	0.0%	493.2	-29.0	-2.3%	482.7	-39.5	-3.2%
Greece	107.0	133.7	25.0%	65.4	59.5	-5.9	-5.6%	59.0	-6.4	-6.0%	-0.6	-0.6%	0.0	0.0%	58.8	-6.6	-6.1%	58.4	-7.1	-6.6%
Hungary	115.4	108.5	-6.0%	81.8	43.7	-38.2	-33.1%	43.5	-38.3	-33.2%	-1.1	-0.9%	4.0	3.5%	46.6	-35.2	-30.5%	46.4	-35.4	-30.7%
Ireland (1)	55.6	62.8	13.0%	41.6	44.8	3.2	5.8%	44.4	2.9	5.2%	-2.8	-5.0%	-1.7	-3.0%	40.3	-1.2	-2.2%	40.0	-1.6	-2.8%
Italy	516.9	483.3	-6.5%	281.7	313.0	31.3	6.1%	312.4	30.7	5.9%	-10.2	-2.0%	-14.8	-2.9%	288.0	6.4	1.2%	287.4	5.7	1.1%
Latvia	25.9	23.8	-8.0%	20.4	8.5	-11.9	-45.9%	8.5	-11.9	-46.1%	-1.3	-4.8%	8.4	32.4%	15.7	-4.8	-18.3%	15.6	-4.8	-18.6%
Lithuania	49.4	45.5	-8.0%	36.9	16.6	-20.2	-41.0%	16.2	-20.7	-41.8%		0.0%	2.1	4.2%	18.7	-18.1	-36.7%	18.3	-18.6	-37.6%
Luxembourg	13.2	9.5	-28.0%	7.0	10.0	3.0	22.6%	9.9	2.9	22.2%		0.0%	-2.7	-20.5%	7.3	0.3	2.1%	7.2	0.2	1.7%
Malta (2)	2.0	no target	no target	na	1.1	na	na	1.0	na	na		na		na	1.1	na	na	1.0	na	na
Netherlands	213.0	200.3	-6.0%	112.8	120.6	7.8	3.7%	119.9	7.2	3.4%	0.0	0.0%	-10.0	-4.7%	110.6	-2.2	-1.0%	110.0	-2.8	-1.3%
Poland	563.4	529.6	-6.0%	323.9	188.4	-135.6	-24.1%	188.4	-135.6	-24.1%	-3.0	-0.5%	0.0	0.0%	185.4	-138.6	-24.6%	185.4	-138.6	-24.6%
Portugal (3)	60.1	76.4	27.0%	41.6	47.1	5.6	9.3%	47.1	5.6	9.3%	-4.7	-7.8%	-1.5	-2.5%	41.0	-0.6	-1.0%	41.0	-0.6	-1.0%
Romania (3)	278.2	256.0	-8.0%	181.9	84.2	-97.7	-35.1%	84.2	-97.7	-35.1%		0.0%	0.0	0.0%	84.2	-97.7	-35.1%	84.2	-97.7	-35.1%
Slovakia	72.1	66.3	-8.0%	33.7	23.6	-10.2	-14.1%	23.5	-10.3	-14.3%		0.0%	8.4	11.7%	32.0	-1.8	-2.5%	31.9	-1.9	-2.6%
Slovenia	20.4	18.7	-8.0%	10.4	11.9	1.4	7.0%	11.6	1.2	5.7%	-1.3	-6.5%	-1.0	-4.9%	9.5	-0.9	-4.4%	9.3	-1.2	-5.7%
Spain	289.8	333.2	15.0%	181.0	230.0	49.1	16.9%	229.6	48.6	16.8%	-5.5	-1.9%	-57.8	-19.9%	166.8	-14.2	-4.9%	166.3	-14.7	-5.1%
Sweden	72.2	75.0	4.0%	52.6	42.0	-10.6	-14.6%	42.0	-10.6	-14.6%	-2.1	-3.0%	0.0	0.0%	39.9	-12.7	-17.6%	39.9	-12.7	-17.6%
United Kingdom	776.3	679.3	-12.5%	433.7	343.9	-89.7	-11.6%	343.9	-89.7	-11.6%	-3.7	-0.5%	0.0	0.0%	340.3	-93.4	-12.0%	340.3	-93.4	-12.0%
EU-15	**4,265.5**	**3,924.3**	**-8.0%**	**2,353.8**	**2,304.3**	**-49.5**	***-1.2%***	**2,285.1**	**-68.7**	***-1.6%***	**-40.2**	**-0.9%**	**-108.4**	**-2.5%**	**2,155.6**	**-198.2**	***-4.6%***	**2,136.4**	**-217.4**	***-5.1%***
EU-27	**5,767.1**	**no target**	**no target**	**na**	**2,780.8**	**na**	**na**	**2,760.4**	**na**	**na**	**-48.0**	**-0.8%**	**-59.0**	**-1.0%**	**2,673.8**	**na**	**na**	**2,653.4**	**na**	**na**

Notes:

(1) Ireland reported an amount of unused allowances projected to remain in their new entrants reserve by the end of the commitment period, which they intend to use for Kyoto compliance. These amounts (1 million AAUs per year) were included in the total allowed emissions of non-ETS sectors.

(2) Malta and Cyprus have no commitment under the Kyoto Protocol, therefore no base year and no emission target. 1990 emissions are used in the column "base year".

(3) Projection data for Bulgaria, Portugal and Romania based on the Primes/Gains model[3].

(4) Data for Denmark includes a base-year compensation of 1 million AAU per year as agreed under the Decision 2010/778/EU (OJ 16.12.2010 L332/41)

Table 7b: Aggregate of total GHG projections for the various scenarios

	Base year emissions	Projections of total emissions with existing measures		With Kyoto mechanisms		With carbon sinks and use of Kyoto mechanisms		With carbon sinks, use of Kyoto mechanisms and impact of the EU ETS cap		Projections of with additional measures, carbon sinks, Kyoto mechanisms, impact of the EU ETS cap	
		Annual average 2008–2012	change from base year	Annual average 2008–2012	change from base year	Annual average 2008–2012	change from base year	Annual average 2008–2012	change from base year	Annual average 2008–2012	change from base year
	Mt CO2 eq.	Mt CO2 eq.	%	Mt CO2 eq.	%	Mt CO2 eq.	%	Mt CO2 eq.	%	Mt CO2 eq.	%
EU-15	4,265.5	3,817.4	-10.5%	3,708.9	-13.0%	3,668.7	-14.0%	3,726.1	-12.6%	3,692.3	-13.4%
EU-27	5,767.1	4,737.9	-17.8%	4,679.0	-18.9%	4,630.9	-19.7%	4,747.6	-17.7%	4,712.3	-18.3%
EU-27 (1990)	5,588.8	4,737.9	-15.2%	4,679.0	-16.3%	4,630.9	-17.1%	4,747.6	-15.1%	4,712.3	-15.7%

Table 8: Comparison of historic GHG emissions and AAUs budgets

	burden sharing or KP target	cumulative AAU budget 2008-2010	Cumulative total GHG emissions 2008-2010	Cumulative use of sink activities 2008-2010	Cumulative gap between relevant AAU budget including sink activities and emissions(1)	
	Mt CO2 eq	Mt CO2 eq	Mt CO2 eq	Mt CO2 eq	Mt CO_2 eq	%
Austria	68,8	206,3	251,4	-2,1	48,2	23,4%
Belgium	134,8	404,4	391,7	0,0	3,7	0,9%
Bulgaria	122,0	366,0	187,6	0,0	-168,2	-45,9%
Cyprus	no target	NA	28,8	NA	no target	no target
Czech Republic	178,7	536,1	409,7	-3,5	-102,1	-19,0%
Denmark	55,8	167,3	185,8	-4,9	8,1	4,9%
Estonia	39,2	117,6	57,1	0,0	-63,4	-53,9%
Finland	71,0	213,0	211,2	-1,8	-3,8	-1,8%
France	563,9	1.691,8	1.581,0	-9,7	-72,5	-4,3%
Germany	973,6	2.920,9	2.860,9	-13,6	-116,8	-4,0%
Greece	133,7	401,2	371,4	-1,9	-33,5	-8,4%
Hungary	108,5	325,4	207,5	-3,2	-119,0	-36,6%
Ireland	62,8	188,5	190,8	-8,4	0,3	0,1%
Italy	483,3	1.449,8	1.526,4	-30,6	70,3	4,9%
Latvia	23,8	71,5	34,1	-3,8	-39,6	-55,4%
Lithuania	45,5	136,4	68,0	0,0	-63,4	-46,5%
Luxembourg	9,5	28,4	36,2	0,0	8,7	30,5%
Malta	no target	NA	8,7	NA	no target	no target
Netherlands	200,3	600,8	614,1	0,0	17,9	3,0%
Poland	529,6	1.588,9	1.165,6	-9,0	-419,0	-26,4%
Portugal	76,4	229,2	227,3	-14,0	-4,0	-1,8%
Romania	256,0	767,9	413,9	0,0	-293,8	-38,3%
Slovakia	66,3	198,9	135,6	0,0	-35,2	-17,7%
Slovenia	18,7	56,2	60,3	-4,0	-0,2	-0,4%
Spain	333,2	999,7	1.126,3	-16,4	143,0	14,3%
Sweden	75,0	225,1	188,0	-6,4	-38,3	-17,0%
United Kingdom	679,3	2.037,9	1.771,0	-11,0	-295,2	-14,5%
EU-15	**3.924,3**	**11.772,8**	**11.523,9**	**-120,6**	**-273,2**	**-2,3%**
EU-27	**no target**	**no target**	**14.307,7**	**-144,1**	**no target**	**no target**

Notes:

(1) includes the impact of the EU ETS cap

(2) 2010 data based on proxy data developed by the EEA[2]

Table 9: Summary of implemented and planned policies and measures

Cross-cutting measures

Policies and measures 'Cross-cutting'	Emission reduction potential in 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential in 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation /timetable /comments
EU Emission Trading Scheme	N/a	N/a	In force
Revision of the monitoring mechanism	N/a	N/a	In force
Link Kyoto flexible mechanisms to emissions trading	N/a	N/a	In force

Energy Supply

Policies and measures 'Energy supply'	Emission reduction potential in 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential in 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation /timetable /comments
Promotion of electricity from RES-E (2001)	100-125[18]		In force
(New) Renewable energy Directive (Directive 2009/28/EC)		600-900[19]	In force
CCS Directive	N/a	0.875[20]	In force
NER300 laying down criteria and measures for the financing of commercial demonstration projects for CCS and innovative renewable energy technologies under the revised EU ETS			In preparation
Directive on promotion of cogeneration	65[21]		In force
Further measures on renewable heat (including biomass action plan)	36-48[22]		Biomass Action Plan, Dec 2005, over 20 further actions planned. Renewable heat included in proposed new Directive on renewable energy
Intelligent Energy for Europe: programme for renewable energy	N/a		Programme for policy support in renewable energy
Developing the internal energy market	80-120 [18]		Amendments to a number of directives[28] to continue to help complete the internal energy market.
TOTAL	**282-358**	**600.9-900.9**	

Energy demand

Policies and measures 'Energy demand'	Emission reduction potential in 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential in 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation / timetable /comments
Directive on the energy performance of buildings	20[24]		In force Monitoring and review
Directive on the energy performance of buildings (recast)		190-290[25]	Adopted on 18 May 2010
Directive on ecodesign requirements for energy-related products Directive on labelling of the consumption of energy and other resources by energy-related products		170	9 implementing measures adopted on ecodesign and 8 on energy labelling. To be revised or complemented by further measures.
Regulation on the labelling of tyres with respect to fuel efficiency and other essential parameters		6-16	
Regulation on energy efficiency labelling programme for office equipment (Energy Star)		11.2 (2009-2014)	
Directive on energy end use efficiency and energy services	92[26]		In force; National Energy Efficiency Action Plans adopted in all EU-27.
Action Plan on Energy efficiency as a follow-up to the Green Paper	N/a		Launched Oct 2006[27]. Identifies 10 priority actions to achieve up to 20% energy savings by 2020.
Action under the Industrial emission directive	Not known		Reference document on Best Available Techniques regarding Energy Efficiency finalised.
Intelligent Energy for Europe programme / Covenant of Mayors	N/a	132	Programme for policy support in energy efficiency
Public awareness campaign on energy efficiency	N/a		Supporting program as part of Intelligent Energy for Europe: In implementation
Programme for voluntary action on motors (Motor Challenge)	30 [18]		Supporting programme for voluntary action on efficient motor systems
Public procurement	25-40 [18]		EU Handbook developed for guidance for increased energy efficient public procurement
TOTAL	**193-208**	**509.2-619.2**	

Transport

Policies and measures 'Transport'	Emission reduction potential in 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential in 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation / timetable / comments
Strategy on CO2 from passenger cars, including voluntary commitment (VC) of car manufacturers' associations	107-117 Out of which VC: 75-80	50[29]	VC: monitoring and review Labelling: in force Communication on fiscal measures: in implementation
Fuel quality Directive		62.5[28]	First implemented in 1998. Revisions adopted in December 2008
Directive on the promotion of transport bio-fuels	35-40[18]		In force
Voluntary agreements with European, Japanese and Korean car manufacturers.	75-80[18]		Implemented
Framework Directive Infrastructure use and charging	N/a		In implementation, in relation to heavy road duty transport only, amendment of "Eurovignette" has been proposed
Infrastructure charging for heavy goods (revised Eurovignette)	N/a		Adopted
Shifting the balance of transport modes	N/a		Package of measures in implementation
Fuel taxation	N/a		In force Focus on EU harmonisation of taxation, not on CO_2 reduction; ongoing review
Directive on mobile air conditioning systems: HFCs	See regulation on fluorinated gases		In force
Inclusion of Aviation in EU ETS		183[30]	Adopted. Will include all flights from 1/01/2012
Public procurement of vehicles		1.9[31]	
TOTAL	**217-237**	**297.4**	

Industry & non CO_2 gases

Policies and measures 'Industry'	Emission reduction potential in 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential in 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation / timetable / comments
Regulation on fluorinated gases (including Directive on mobile air conditioning systems)	23[32]	**46**[40]	In force
IPPC & non-CO_2 gases	60-70[18]		In force In 2008 the Directive was codified and in 2010 amended by the Industrial Emissions Directive

Waste

Policies and measures 'Waste'	Emission reduction potential in 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential in 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation / timetable / comments
Landfill Directive	41[18]		In force
Waste Framework Directive			Adopted. Launched December 2005[33], including a revision of the original waste directive of 1975, revised in 2008.
Thematic Strategy on waste			Launched in 2005
Directives on waste electrical and electronic equipment (WEEE)	35[34]		In force. Revised directive in 2008

Integration Research & Development

Policies and measures	Emission reduction potential in 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential in 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation /timetable /comments
R&D framework Program	N/a		In force. Under the 7th Framework program (FP7), which runs from 2007 to 2013, a budget of 50.5 billion euros will be allocated over the entire period. Over 2.3 billion to energy related R&D activities.
Competitiveness and Innovation Framework Programme (CIP)			CIP runs from 2007 to 2013 with a total budget of 3.6 billion euros. The CIP is divided in three operational programmes two of which are related to energy and climate change.

Integration Cohesion Policy

Policies and measures	Emission reduction potential in 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential in 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation /timetable /comments
Integration climate change in structural funds &cohesion funds	N/a	N/a	For the budgetary period 2007-13 sustainable transport, adaptation, renewable energy and energy efficiency have been indentified as eligible areas for support.

Agriculture

Policies and measures 'Agriculture'	Emission reduction potential in 2010 in EU-15 (Mt CO_2-eq.)	Emission reduction potential in 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation /timetable /comments
CAP health check (2003 reform) - Rural development policies - Market policies	60-70[35] 12[35]		Adopted. In 2008 the European Commission decided to move to new changes to the CAP.
Rural development policy	N/a		Rural development policy for 2007-13 focus on: - Improving competitiveness - Improving the environment - Improving quality of life and encourage diversification of the rural economy.
Reduction of CH4 and N2O from animal manure	1.7		Possibility for support through Rural development programmes
N_2O from soils	10[36]		Improved implementation of the nitrates Directive
Proposed soil directive	N/a	N/a	The European Climate Change Programme (ECCP) Working Group on Sinks Related to Agricultural Soils estimated this potential at equivalent to 1.5 to 1.7% of the EU's anthropogenic CO2 emissions during the first commitment period under the Kyoto Protocol[37]

Forests

Policies and measures 'Forests'	Sequestration potential in 2010 in EU-15 (Mt CO_2-eq.)	Sequestration potential in 2020 in EU-27 (Mt CO_2-eq.)	Stage of implementation /timetable /comments
EU Forest Action Plan	N/a	N/a	Adopted. The Forest Action Plan presented in June 2006 builds on the EU's Forestry Strategy adopted in 1998.
Afforestation and reforestation: - Afforestation programmes - Natural forest expansion	14[18]		Possibility for support through forestry scheme of rural development
Restoration of forests damaged by natural disasters, fires, pests damage and forest fire prevention action			Possibility for support through Rural development programmes, specific measure for restoring forestry potential and introduction of prevention actions
Forest management (various measures)	19 [18]		Possibility for support through forestry scheme of rural development, dependent on national implementation.

Table 10: Key figures of the emissions trading scheme for 2005-2007, 2008, 2009 and 2010 for EU-27[(1)]

	Number of installations (2)				Allocated allowances				Verified emissions			
					Mt CO_2-eq.				Mt CO_2-eq.			
	2005–2007	**2008**	**2009**	**2010**	**2005–2007**	**2008**	**2009**	**2010**	**2005–2007**	**2008**	**2009**	**2010**
1. Combustion installations	6.932	7.070	7.169	7.175	1.502	1.255	1.265	1.279	1.531	1.496	1.366	1.394
2. Mineral oil refineries	150	151	149	148	165	152	152	155	155	154	145	142
3. Coke ovens	20	21	22	22	23	23	23	23	21	21	16	20
4. Metal ore roasting or sintering	19	28	28	28	33	22	22	22	24	18	11	13
5. Pig iron or steel	229	236	235	231	156	185	185	184	131	133	95	114
6. Cement clinker or lime	531	550	554	541	199	210	212	213	194	189	151	151
7. Glass including glass fibre	412	433	431	421	23	25	25	26	21	23	19	20
8. Ceramic products by firing	1.139	1.071	1.073	1.040	18	19	19	19	15	13	9	9
9. Pulp, paper and board	795	792	783	758	37	38	39	39	30	31	28	29
99. Other activity opted-in	320	399	411	438	0 (3)	23	24	21	21	23	20	21
All EU installations	**10.548**	**10.751**	**10.855**	**10.802**	**2.157**	**1.950**	**1.966**	**1.980**	**2.144**	**2.100**	**1.860**	**1.913**

	Difference between verified emissions and allocated allowances			
	%			
	2005– 2007	**2008**	**2009**	**2010**
1. Combustion installations	1,9%	19,2%	8,0%	9,0%
2. Mineral oil refineries	-6,1%	1,2%	-4,9%	-8,6%
3. Coke ovens	-8,5%	-6,8%	-30,0%	-12,7%
4. Metal ore roasting or sintering	-27,3%	-19,4%	-49,8%	-39,9%
5. Pig iron or steel	-15,5%	-27,9%	-48,4%	-38,3%
6. Cement clinker or lime	-2,7%	-9,9%	-28,7%	-28,9%
7. Glass including glass fibre	-5,8%	-9,7%	-24,0%	-21,3%
8. Ceramic products by firing	-17,3%	-28,1%	-52,8%	-53,5%
9. Pulp, paper and board	-19,7%	-18,0%	-29,1%	-24,7%
99. Other activity opted-in	8400,8%	-0,9%	-16,9%	0,0%
All EU installations	**-0,6%**	**7,7%**	**-5,4%**	**-3,4%**

Notes:

(1) Please note that due to changes in the application of the scope (i.e. the coverage by the EU ETS of installations or emissions) in some Member States between the 2005-2007 and the 2008-2012 trading period, one can not perfectly compare data (whether it is allocated allowances or verified emissions) that relate on the one hand to the 2005-2007 trading period, and on the other hand to the 2008-2012 trading period.

(2) All installations which have participated in the scheme are included, even if their account is already closed.

(3) The exact figure is 245000 allowances but appearing as 0 due to rounding.

(4) For RO and BG data for 2007 is added on top of EU-25 2005-2007 average and not divided by three for 2005-2007 average. For CY no verified emissions are available for 2010.

Source: EEA EU ETS data viewer (May 2011)

Table 11: Overview on the EU ETS verified emissions and 2nd NAPs(1)

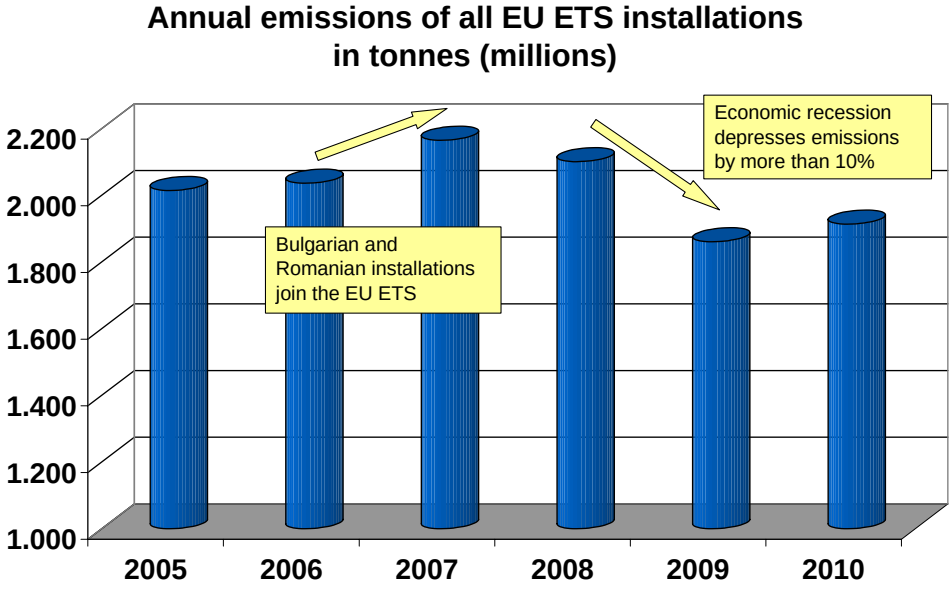
Member State	2005-2007 average emissions	2008-2012 EU ETS cap	Allocated allowances average 2008-2010	2008 verified emissions	2009 verified emissions	2010 verified emissions
	Mt CO_2-eq. per year	Mt CO_2-eq. per year	Mt CO_2-eq. per year	Mt CO_2-eq. per year	Mt CO_2-eq. per year	Mt CO_2-eq. per year
Austria	32,5	30,7	31,6	32,0	27,3	31,0
Belgium	54,3	58,5	56,1	55,5	46,2	50,1
Bulgaria	39,2	38,1	38,0	38,3	32,0	33,5
Cyprus	5,2	5,2	5,1	5,6	5,4	NA
Czech Republic	84,6	86,7	85,9	80,4	73,8	75,6
Denmark	30,0	24,5	23,9	26,5	25,5	25,3
Estonia	13,4	11,8	11,8	13,5	10,3	14,4
Finland	40,1	37,6	37,2	36,2	34,3	41,3
France	128,3	132,0	129,5	124,1	111,1	114,7
Germany	480,1	451,5	393,7	472,7	428,2	454,7
Greece	71,3	68,3	63,9	69,9	63,7	59,9
Hungary	26,3	26,7	24,9	27,2	22,4	23,0
Ireland	21,8	21,3	20,3	20,4	17,2	17,4
Italy	226,6	201,6	207,1	220,7	184,9	191,5
Latvia	2,9	3,4	3,3	2,7	2,5	3,2
Lithuania	6,4	8,6	7,7	6,1	5,8	6,4
Luxembourg	2,6	2,5	2,5	2,1	2,2	2,3
Malta	2,0	2,1	2,1	2,0	1,9	1,9
Netherlands	79,0	87,5	81,8	83,5	81,0	84,4
Poland	207,5	205,7	202,8	204,1	191,2	199,7
Portugal	33,6	34,8	31,4	29,9	28,3	24,2
Romania	69,6	74,1	73,5	64,1	49,0	47,3
Slovak Republic	25,1	32,5	32,2	25,3	21,6	21,7
Slovenia	8,9	8,3	8,2	8,9	8,1	8,1
Spain	183,3	152,2	151,6	163,5	136,9	121,5
Sweden	19,4	22,5	21,8	20,1	17,5	22,7
United Kingdom	250,1	245,6	217,5	265,1	232,0	237,4
EU-27	**2.144,0**	**2.074,3**	**1.965,3**	**2.100,2**	**1.860,1**	**1.913,2**

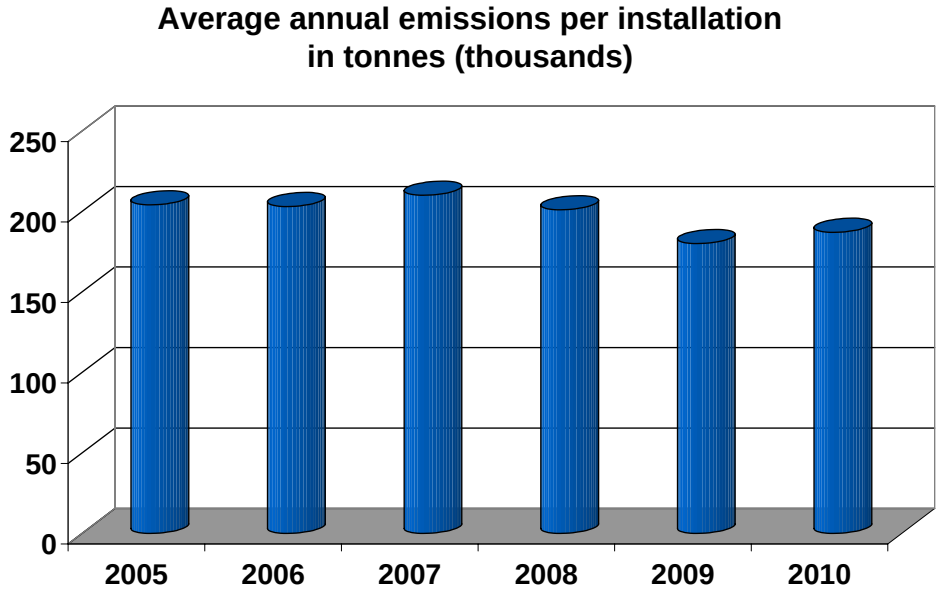
Member State	2009 verified emissions compared to EU ETS cap	2010 verified emissions compared to EU ETS cap	Share of EU ETS in total GHG emissions in 2008	Share of EU ETS in total GHG emissions in 2009	Share of CER in total surrendered allowances in 2009	Share of ERU in total surrendered allowances in 2009
	%	%	%	%	%	%
Austria	-11%	1%	37%	34%	1,4%	0,0%
Belgium	-21%	-14%	41%	37%	1,4%	0,0%
Bulgaria	-16%	-12%	55%	54%	0,0%	0,0%
Cyprus	2%	NA	55%	57%	69,3%	0,0%
Czech Republic	-15%	-13%	57%	56%	3,9%	0,1%
Denmark	4%	3%	42%	42%	0,6%	0,0%
Estonia	-13%	22%	67%	61%	0,0%	0,0%
Finland	-9%	10%	51%	52%	3,8%	0,4%
France	-16%	-13%	23%	21%	3,5%	0,3%
Germany	-5%	1%	48%	47%	5,7%	0,1%
Greece	-7%	-12%	54%	52%	0,2%	0,0%
Hungary	-16%	-14%	37%	34%	5,6%	0,1%
Ireland	-19%	-18%	30%	28%	1,3%	0,0%
Italy	-8%	-5%	41%	38%	4,2%	0,1%
Latvia	-27%	-5%	23%	23%	16,1%	0,3%
Lithuania	-33%	-25%	25%	27%	14,8%	6,3%
Luxembourg	-12%	-9%	17%	19%	1,1%	0,0%
Malta	-11%	-12%	67%	66%	0,0%	0,0%
Netherlands	-7%	-3%	41%	41%	0,9%	0,0%
Poland	-7%	-3%	52%	51%	5,0%	0,1%
Portugal	-19%	-31%	38%	38%	5,2%	0,0%
Romania	-34%	-36%	42%	37%	6,5%	0,6%
Slovak Republic	-34%	-33%	53%	50%	5,4%	0,0%
Slovenia	-3%	-2%	42%	42%	4,3%	2,0%
Spain	-10%	-20%	40%	37%	5,1%	0,0%
Sweden	-22%	1%	32%	29%	2,4%	0,0%
United Kingdom	-6%	-3%	43%	41%	2,0%	0,1%
EU-27	**-10%**	**-8%**	**42%**	**40%**	**3,9%**	**0,2%**

Notes: (1) Please note that due to changes in the application of the scope (i.e. the coverage by the EU ETS of installations or emissions) in some Member States between the 2005-2007 and the 2008-2012 trading period, one can not perfectly compare the verified emissions data that relate on the one hand to the 2005-2007 trading period, and on the other hand to the 2008-2012 trading period. (2) Data on the EU ETS cap may differ from final values yet to be determined by the European Commission due to the fact that issues such as the treatment of the new entrant reserves are still pending. (3) For Ireland, the ETS cap is reduced by the expected leftover units in the new entrants' reserve at the end of the trading period which will not be distributed to operators but used for Kyoto compliance. (4) For RO and BG data for 2007 is added on top of EU-25 2005-2007 average and not divided by three for 2005-2007 average.

Source: EEA EU ETS data viewer, http://ec.europa.eu/clima/documentation/ets/registries_en.htm, http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php (June 2011)

Figure 2: Overview on the EU ETS emissions





Notes:
(1) The CITL data as illustrated in the graph above indicate the total amount of verified emissions of all EU ETS installations per year. However, these figures do not allow for comparing annual emissions, as they do not account for changes in the scope of the system: over the years new sectors and countries joined the EU ETS. Therefore the average annual emissions per installation were calculated, based on the annual verified emissions and the exact amount of installations emitting in the respective year. The results are illustrated in the second graph.
(2) The calculation of average annual emissions per installation emitting is based on the total verified emission figures of each year, as reported by the CITL. For each year, the number of installations actually emitting was identified. Then, the total verified emissions of each year were divided by the total number of installations actually emitting, thus delivering the average annual emissions per installation emitting. For example, in 2008 total verified emissions were at 2,100,320,867 tonnes of CO_{2eq}. The actual number of installations emitting in 2008 was 10.440. This results in an average of 201,180 tonnes of CO_{2eq} emissions per installation in 2008.

Table 12: Planned government use of the Kyoto mechanisms

Member State	Planned use of Kyoto mechanisms	Type of Kyoto mechanisms (IET, CDM, JI)	Achievement of Kyoto target planned through domestic action only	Implemented use of credits at government level (1)	Projected emission reduction 2008-2012 through the use of Kyoto mechanisms	Budget (2)
				[Mt CO2 eq. per year]	[Mt CO_2 eq. per year]	[Mio € for 2008-2012]
Austria	Yes	IET, JI, CDM	No	0,6	9,0	531
Belgium	Yes	IET, JI, CDM	No	1,0	6,3	276
Bulgaria	No	-	Yes	0,0	-1,4	-
Cyprus	No	-	Not applicable	not applicable	-	-
Czech Republic	No	-	Yes	-27,2	-25,0	-
Denmark	Yes	IET, JI, CDM	No	0,5	3,7	217
Estonia	No	-	Yes	-0,1	-1,2	-
Finland	Yes	IET, JI, CDM	No	0,2	1,0	70
France	No	-	Yes	0,1	-	-
Germany	No	-	Yes	1,1	-	-
Greece	No	-	Yes	0,0	-	-
Hungary	No	-	Yes	-3,4	-4,0	-
Ireland	Yes	IET, JI, CDM	No	2,7	1,7	290
Italy	Yes	IET, JI, CDM	No	0,7	14,8	-
Latvia	No	-	Yes	-18,2	-8,4	-
Lithuania	No	-	Yes	0,0	-2,1	-
Luxembourg	Yes	IET, JI, CDM	No	0,4	2,7	250
Malta	No	-	Not applicable	not available	-	-
Netherlands	Yes	IET, JI, CDM	No	7,7	10,0	500
Poland	No	-	Yes	0,0	-	-
Portugal	Yes	IET, JI, CDM	No	0,2	1,5	106
Romania	No	-	Yes	0,4	-	-
Slovakia	No	-	Yes	-7,4	-8,4	-
Slovenia	Yes	IET, JI, CDM	No	0,0	1,0	80
Spain	Yes	IET, JI, CDM	No	10,9	57,8	386
Sweden	No	-	Yes	-0,4	-	178
United Kingdom	No	-	Yes	2,2	-	-
EU-15	**Yes**	**IET, JI, CDM**	**No**	**28,0**	**108,4**	**2.803**
EU-27	**Yes**	**IET, JI, CDM**	**Not applicable**	**-27,9**	**59,0**	**2.883**

Notes:

(1) Implemented use of credits covers credits delivered to/sold from party holding account, 2008-2009 average.

(2) The figure for budget does not include the revenue from the sale of AAUs

(3) Cyprus and Malta have no emissions targets for the period 2008-2012 under the Kyoto Protocol.

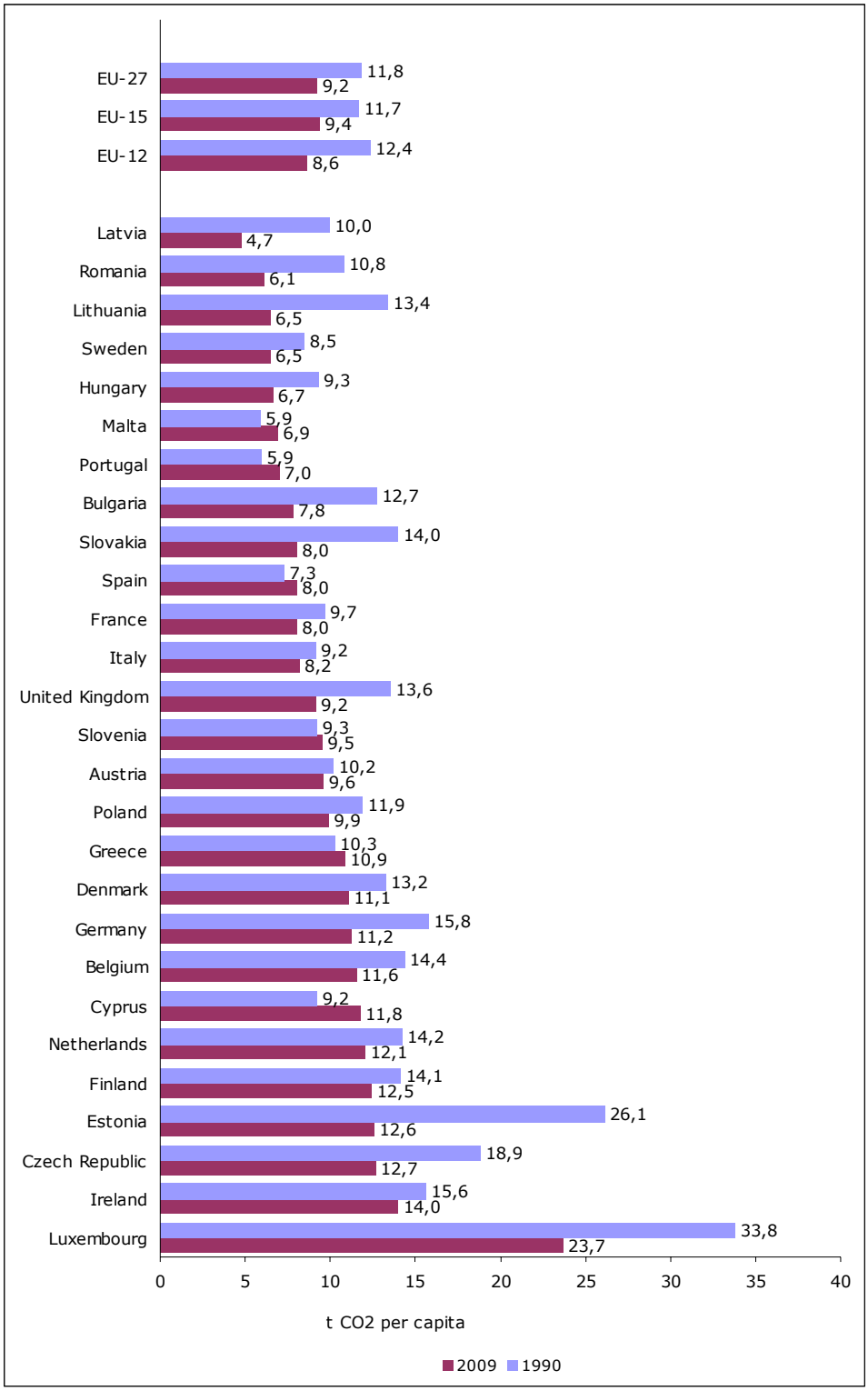
Source: Questionnaires and projection reports submitted under the greenhouse gas Monitoring Mechanism, SEF tables (26 May 2011) and the EEA EU ETS data viewer (12 July 2011)

Table 13: Projected net carbon stock changes under Articles 3.3 and 3.4 for the first commitment period

	Article 3.3	Article 3.4			Total
	Net carbon stock change during 2008–12	Election of activities[1]	Net carbon stock change during 2008–12 [3]	Maximum allowance for forest management	
	[Mt CO_2 per year]		[Mt CO_2 per year]	[Mt CO_2 per year]	[Mt CO_2 per year]
Austria	-0,7	None	NA	NA	-0,7
Belgium	No estimates available	None	NA	NA	NE
Bulgaria	Not reported	None	NA	NA	NE
Cyprus	Not reported	NA	NA	NA	NE
Czech Republic	Probably small sink	FM	Removals likely larger than max. allowance	-1,2	-1,2
Denmark	-0,1	FM, CM, GM	FM: 0.42 CM+GM: -1.7	-0,2	-1,6
Estonia	Probably net sink	None	No estimates available	NA	NE
Finland [2]	+3 to +4	FM	> -10,00 to -20,00	-0,6	-0,6
France	No reliable estimates available, probably net source	FM	>-70.00	-3,2	-3,2
Germany	No estimates available	FM	-7,3	-4,6	-4,5
Greece	-0,3	FM	-1.50 to -2.00	-0,3	-0,6
Hungary	Probably net sink	FM	-4,24	-1,1	-1,1
Ireland	-2,8	None	NA	NA	-2,8
Italy	No quantitative estimates available	FM	-10,2	-10,2	-10,2
Latvia	Net source	FM	Removals likely larger than max. allowance	-1,3	-1,3
Lithuania	Probably net sink	FM	No estimates available	-1,0	NE
Luxembourg	0	None	NA	NA	NE
Malta	Not reported	NA	NA	NA	NE
Netherlands	0,0	None	NA	NA	0,0
Poland	Net sink	FM	Removals likely larger than max. allowance	-3,0	-3,0
Portugal	-3,4	FM, CM, GM	FM: -0.81 CM+GM: -0.50	-0,8	-4,7
Romania	Not reported	FM, Revegetation	Not reported	-4,0	NE
Slovakia	Net sink	None	NA	NA	NE
Slovenia	No estimates available	FM	-1,32	-1,3	-1,3
Spain	-3,0	FM, CM	-2,5	-2,5	-5,5
Sweden [2]	1,5	FM	-38,5	-2,1	-2,1
United Kingdom	-2,3	FM	-1,4	-1,4	-3,7
EU-15	**-8,9**	**NA**	**-27,7**	**NA**	**-40,2**
EU-27	**-8,9**	**NA**	**-35,5**	**NA**	**-48,0**

Notes:
Consistent with the reporting of emission inventories a negative sign '-' is used for removals and a positive sign '+' for emissions; NA: not applicable; NE: not estimated.
(1) FM: forest management; CM: cropland management; GM: grazing land management.
(2) In addition to accounting for forest management up to the maximum allowance Parties may account for removals from forest management to compensate net emissions under Art. 3.3. In Finland and Sweden, removals from forest management are projected to exceed the sum of emissions under Art. 3.3. and the maximum allowance for forest management.
(3) The sum for EU-15 and EU-27 includes emissions and removals from Article 3.4 activities as indicated by Member States with application of the cap for Forest Management. Note that the net carbon stock change during 2008–12 resulting from Art. 3.3 activities plus net carbon stock change during 2008–12 resulting from Art. 3.4 activities for EU-15 and EU-27 does not result in their totals, as net emissions from Art. 3.3 in Finland and Sweden could be completely compensated with net removals from Art. 3.4 in these Member States.
Source: Questionnaires and projection reports submitted under the EC greenhouse gas Monitoring Mechanism; The European Community's initial report under the Kyoto Protocol (EEA Technical report No 10/2006); Initial reports under the Kyoto Protocol of Greece and Romania; Decisions 16/CMP.1 and 8/CMP.2 of the Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol.

Figure 3: Greenhouse gas emissions per capita of EU-27 Member States for 1990 and 2009



Source: EEA

Table 14: A comparison of EU-27 GHG total emissions and projections under the current Kyoto Protocol and under the Climate & Energy Package

The EU uniteral 20% reduction commitment by 2020 includes also CO_2 emissions from international flights from/to the EU. The Kyoto Protocol covers only GHG emissions from domestic aviation. The table below presents the quantitative differences. Reductions achieved by the EU-27, so far, when the emissions from international aviation are also taken into account, amount to -14.1%[38] compared to 1990 levels[39].

	1990	**2005**	**2009**	**2020**
	Mt CO_2 eq.	Mt CO_2 eq.	Mt CO_2 eq.	Mt CO_2 eq.
Kyoto Protocol scope				
Total GHG emissions	**5588.8**	**5148.8**	**4614.5**	
of which domestic aviation	*14.3*	*19.1*	*17.6*	
Projections as compilation of MS data, WEM scenario				**4509.6(1)**
-20% compared to Kyoto base year(2)				**4613.7**
Climate & Energy Package scope				
Total GHG emissions	**5657.0**	**5279.5**	**4746.5**	
of which domestic aviation	*14.3*	*19.1*	*17.6*	
of which international aviation CO_2	*68.2*	*130.8*	*132.0*	
Projections based on PRIMES/GAINS model, baseline scenario				**4794.1**
-20 % compared to 1990				**4525.6**

Note: (1) This projected value is based on aggregated national projections[3]. It includes a value for Germany which is based on projections completed in the first half of 2009. Therefore a sensitivity analysis based on more recent European projections, the PRIMES/GAINS baseline, has been carried out. Using this result would lead to 27 Mt or 0.5% higher EU total emissions. (2) The Kyoto base year emissions is different from 1990 emissions level and amount to 5767.1 Mt CO2 eq. (3) data on historic emissions based on EU GHG inventory submission 2011; (4) figures for emissions from domestic aviation cover CO_2, CH_4, N_2O; figures for emissions from international aviation covers CO_2 only

Table 15: Monitoring of the implementation of the White Paper - Joint Action Plan

Action	EU Action – current status and plans
1) Developing the knowledge base	
Establish by 2012 a Clearing House Mechanism	The EU Clearinghouse Mechanism is a web-based tool and will help decision makers at nation, regional and local level to establish adaptation strategies. The 1st Prototype of the EU Clearinghouse has been delivered at the end of April 2011 and is currently under evaluation. The Clearinghouse will go "live" in March 2012.
Develop methods, models, data sets and prediction tools by 2011	Under the EU's 7th Framework Program for Research / FP7 (2007-2013) climate change remains a key priority including research on climate change adaptation. A number of projects funded under FP 7 will contribute to the improvement of the assessment framework by improvement of the understanding of the climate system and its processes, the quantification of climate change impacts on human and natural systems (including extreme events), and to the identification and assessment of mitigation and adaptation options including their costs. These research projects also serve as a knowledge basis for the development and support of international climate policies as well as policies on e.g. disaster reduction (including hydrometeorological hazards). Most relevant FP7 (and still ongoing FP6) projects: **ClimateCost:** *Full costs of inaction and adaptation of climate change;* **CLIMSAVE:** *Climate change integrated assessment methodology for cross-sectoral adaptation and vulnerability*; **RESPONSES:** *European responses to climate change: deep emission reductions and mainstreaming of mitigation and adaptation*; **MEDIATION:** *Methodology for effective decision-making on impacts and adaptation;* **CCTAME:** *Climate change, Terrestrial adaptation and mitigation;* **ClimateWater:** *Bridging the gap between adaptation strategies of climate change impacts and European water policies;* **ACQWA:** *Assessing climatic change and impacts on the quality and quantity of water;* **IMPRINTS:** *Improving preparedness and risk management for flash floods and debris flow events;* **CLIWASEC:** Cluster - *Climate-Water-Security;* **CIRCE:** *Climate Change and Impact Research: the Mediterranean Environment;* **WATCH:** *Water and Global Change* **ANIMALCHANGE** *An integration of mitigation and adaptation options for sustainable livestock production under climate change*
Develop indicators to better monitor the impact of climate change, including vulnerability impacts, and progress on adaptation by 2011	A set of studies and contributions from research projects will be used to convert the generic concept of vulnerability promoted by the Impact Assessment A (in the line of IPCC AR4) into an operational instrument to be used for raising awareness, guiding adaptation policy design (e.g. funding requirements), assessing the effectiveness of adaptation measures. Risk assessment and mapping guidelines for disaster management have been adopted by the European Commission at the end of 2010.
Assess the cost and benefit of adaptation options by 2011	A database on adaptation measures will be the backbone of this action. It will be integrated into the EU Clearinghouse and will gather information available from existing FP7 projects and other on-going projects (see above). A methodological study has been launched that will conduct an extensive review of available information on costs of adaptation on adaptation measures within the EU and a review of existing methodologies for identifying these costs. It will also assess and compare such methodologies, identify the methodological and data challenges associated with calculating the expenditure on adaptation. It will propose a set of criteria for classifying different projects, programs or budget lines and calculating the expenditure on and propose a system to estimate the "adaptation share" for projects not exclusively intended for adaptation as well as producing a list of frequently occurring cases and borderline cases. The PESETA II project, i.e. a multi-sectoral, bottom-up high-resolution impact and adaptation assessment using most recent high-resolution regional climate projections for Europe (IPCC/SRES in ENSEMBLES project) and operational physical impact models was initiated.
Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE JPI)	Joint programming on adaptation to and mitigation of climate change in the agriculture, forestry and land use sector will bring national research programmes into a common strategy. More than 20 European Countries are members. It will include research on climatic trends with extreme events, natural sciences with social sciences, research with actual policy and management, ecosystems with products and services, production with health, food security and food quality issues.
Implement, by 2015, the Global Earth Observation System of Systems (GEOSS)	Currently in the process of being built, GEOSS will aim at encompassing all areas of the globe, and to cover in situ, airborne, and space-based observations. GEOSS will meet the need for timely, quality long-term global information as a basis for sound decision-making. The data and information include Climate change with the strategic target to achieve effective and sustained operation of the global climate observing system and reliable delivery of climate information of a quality needed for predicting, mitigating and adapting to climate variability and change, including for better understanding of the global carbon cycle.
2) Integrating adaptation into EU policies	
a) Health and social policies	

Action	EU Action – current status and plans
Develop guidelines and surveillance mechanisms on the health impacts of climate change by 2011	The EU has explored with the WHO and EU agencies means of ensuring adequate surveillance and control of the impact of climate change on health, such as epidemiological surveillance, the control of communicable diseases and the effects of extreme events. The Parma Ministerial Declaration brings new priorities in the environment and health process with one pillar dedicated on protecting health and environment from climate change. The Health Programme of the European Union has been the key financing mechanism for projects, setting up networks and initiatives to support the work of the Health Security Committee. Funding of projects to address adaptation to climate change has been foreseen under the work plans for 2009-2011, including: **PHASE** will provide the public health sector with prevention guidelines to promote resilience and reduce health risk associated to extreme weather events, their environmental consequences and development of tools to select vulnerable subgroups most at risk to specific extreme weather events; **CLIMATE TRAP:** Impact assessment, surveillance and preparedness guidelines, training, will play a pivotal role in assisting the process of strengthening the implementation of existing warning systems and plans and in strengthening the Health Sector in preparedness in facing the health impact of climate change; **HIALINE** aims at evaluating the effects of climate diversity and change on airborne allergen exposure, and to implement an outdoor allergen early warning network; **EUROSUN** aims at monitoring ultra violet exposure in the EU and its effects on incidence of skin cancers and cataracts; **EUROMOMO** aims at develop and operate a coordinated approach to real-time mortality monitoring across Europe such as pandemic influenza, emerging infections as well as environmental conditions with an impact on public health, i.e. heat waves and cold spells; **CEHAPIS:** Impact assessment, policy options and indicators on health and climate change aims at providing an evaluation of policy option impacts for successful health adaptation to climate change and monitor trends and policies over time; **EDEN** (Emerging diseases in a changing European environment) contributed to this effort. The **Health Security Initiative** aims at streamlining and strengthening capacities on health security to improve the protection of the EU citizen from serious cross border threats that can affect human health. It includes threats posed by the impacts of climate change. EFSA is developing scientific reports on vector-borne diseases, such as a general overview of the geographical distribution of tick species and an update on the role of the tick vectors in the epidemiology of African Swine Fever and Crimean-Congo Hemorrhagic Fever in Eurasia.
Development of a new Animal Disease Information System (ADIS)	The development of a new ADIS will provide better and more comparable epidemiological data to risk managers, enabling them to better identify, evaluate and respond to changing or emerging disease situations.
Develop a new EU Plant Health Law addressing phytosanitary consequences of climate change	The Common Plant Health Regime (CPHR) concerns pests and diseases that impact on plant production in agriculture, forestry and the natural environment with the objective to contribute to plant health through sustainable production. The evaluation of the CPHR has been the starting point for a fundamental review of the regime for addressing the phytosanitary consequences of globalisation and climate change. A legal proposal for the new EU plant health law is foreseen by 2012. **CLIMPEST** is a project about the establishment of harmful organism due to climate change.
Assess the impacts of climate change and adaptation policies on employment and on the well-being of vulnerable social groups	The social dimension of adaptation policies needs to be pursued within existing EU processes in the social and employment fields, and all social partners need to be involved. ECDC (European Centre for Disease Prevention and Control) is mapping EU vulnerability on climate change and has developed a Handbook for National Vulnerability, Impact, and Adaptation Assessments. See also **PHASE** project.
Step up existing animal disease surveillance and control systems	The ECDC, EFSA and the Animal Health legislation - are conducting many activities and projects which contribute on the strengthening of the knowledge base on climate change health impacts, vulnerability and adaptation, such as setting up of the European Environment and Epidemiology Network, development of a Handbook for National Vulnerability, Impact, and Adaptation Assessments and risk assessment for the water-, food- and vector-born diseases.
b) Agriculture and forests	
Measures for adaptation and water management in rural development national strategies and programmes for 2007-2013	The EU regulation on rural development 2007-2013 contains explicit references to the need to anticipate the likely effects of climate change on agriculture. Member States receiving additional funds via the increased modulation presented revised rural development national strategies and programmes (RDP) to better respond to the various new challenges. A share of the new funds made available has been allocated to mitigation and adaptation measures. A review of the extent to which climate change is addressed in the national and regional RDP for 2007-2013 has been carried out across the EU. All these evaluations are taken into account in the ongoing impact assessment in view of a new framework for the CAP post 2013.
Integration of adaptation into 3 strands of rural development, adequate support for sustainable production,	A number of actions with adaptation potential have been programmed by Member States and regions. Almost 70% of the RDP include actions to renovate irrigation equipment to improve the efficiency of water use. Half of the RDP supports waste water treatment installations on farms and water saving production techniques.

Action	EU Action – current status and plans
contribution of the CAP to the efficient use of water in agriculture	Around 40% of the programmes also include the development/improvement of farm water storage capacity. Due the Health Check better water management objectives have been included in the scope of cross compliance with a new GAEC issue relating to protection and management of water.
Examine the capacity of the Farm Advisory System to reinforce training, knowledge and adoption of new technologies that facilitate adaptation	The Farm Advisory System (FAS) is an important tool to improve farm management. It requires national authorities to offer advice to farmers, at least for the rules included into cross compliance. Member States may use the FAS for advising farmers on the respect of standards going beyond cross compliance, e.g., water commitments under agri-environmental measures. RDP provides the possibility to co-finance the setting-up of the FAS and its use by farmers. The revision of FAS will be part of the reflections on the CAP post-2013 and enhancing its role in climate change related issues is part of the proposals being assessed.
Update forestry strategy and launch debate on options for an EU approach on forest protection and forest information systems	The 1998 EU Forestry Strategy established a framework for forest-related actions in support of sustainable forest management (SFM) which is currently being revised. A Green Paper on forest protection and forest information (preparing forests for climate change) was adopted in 2010 with a view to strengthening EU action on forest protection and forest information systems, currently a follow-up of the Green Paper on forest protection and information is ongoing. Two ongoing studies will have links to adaptation: "Disturbance of EU forests by biotic agents" and "Influences of EU forests on weather patterns". The EU's rural development policy for the period 2007–2013 provides a basis for the full integration of forestry into rural development. In the context of the review of Rural Development Policy post 2013 the further development of the forestry measures will be examined.
European Consortium for Modelling of Air Pollution and Climate Strategy	Linkage of many sectoral models. Baseline and Forecasts on non CO2 emissions• Providing scientific and economic analyses for the revision of the EU Thematic Strategy on Air and the European Climate Change Programme (ECCP)
LULUCF Accounting tool	Modelling tool for international negotiations on LULUCF CO2 sink/source
An analysis of potential and costs of LULUCF use by EU MS	This study is aimed at developing projections for LULUCF emissions by 2020 and 2030, covering forests, agricultural soils and wetlands. A next step will include policy scenarios deviating from BAU, taking account of the Copenhagen agreement and further policy options to be implemented at EU level. Finally, potential and costs for reducing net emissions from LULUCF will be estimated at MS level.
options for including LULUCF in the Community reduction commitment and instruments for increasing GHG mitigation efforts in the LULUCF and agriculture sectors	This study will propose and assess policy options for including LULUCF in the Community reduction commitment. Options proposed should feed into the above-mentioned study on projections and cost modelling. It will further identify relevant emissions and removals and mitigation measures, and the potential for amended and/or additional policy measures for LULUCF and agriculture.
Evaluation of livestock sector's contribution to EU greenhouse gas emissions - phase II	**COMPLETED -** The objective of the GGELS project was to provide an estimate of the net emissions of GHGs and ammonia (NH3) from livestock sector in the EU-27 according to animal species, animal products and livestock systems following a food chain approach. The project provides a quantification of GHG and NH3 emissions both ex-post for the year 2004 and ex-ante according to the latest CAPRI projections for the year 2020.
CC mitigation potential of EU Farm	To better understand the GHG profile of common farm practices in the EU, and how these practices fit into the major farming systems. Understand how changes to these practices can improve the GHG profile. To propose a tentative model for a whole-farm assessment of GHG profile and to understand the potential synergies between the different practices discussed.
Assessing Agriculture Vulnerabilities to design Efficient Measures for Adaptation to Climate Change - AVEMAC	Building on a large number of studies already available, the objective of the study is to provide an updated and in depth estimate of the main vulnerabilities of the European productions in the main producing regions in the short and medium term, assess the possible impacts (at macro level and at micro level using farm type) and adaptation potential in order to define the more efficient adaptation measures to be recommended.
Modelling water scenarios and sectoral impacts	This project aims at shedding light on both, vulnerability and adaptive capacity, in different sectors and across the Europe's river basins.
Identification and Elaboration of Methodology for classification and costing of projects/programmes for adaptation to climate change	To conduct an extensive review of available information on costs of adaptation within the EU (and when appropriate neighbouring countries) and a review of existing methodologies for identifying these costs. To assess and compare such methodologies identifying the methodological and data challenges associated with calculating the expenditure on adaptation. To propose a set of criteria for classifying different projects, programs or budget lines and calculating the expenditure and propose a system to estimate the "adaptation share" for projects not exclusively intended for adaptation. The scope of adaptation options does not include small-scale private autonomous adaptation measures (e.g. farm-level adaptation practices, air conditioning).

Action	EU Action – current status and plans
Inventory of certification schemes for agricultural products and foodstuffs marketed in the EU member states	To put in place an inventory of certification schemes for agricultural products and foodstuffs which are marketed in the EU, to describe the main parameters of these schemes and classify them according to a number of criteria.
c) Biodiversity, ecosystems and water	
Explore the possibilities to improve policies and develop measures which address biodiversity loss and climate change in an integrated manner to fully exploit co-benefits and avoid ecosystem feedbacks that accelerate global warming	Climate change was one of the four key policy areas identified in the Commission Communication on "Halting the loss of Biodiversity by 2010 – and beyond" and the Biodiversity Action Plan includes the objective "to support biodiversity adaptation to climate change". The EU Biodiversity Strategy up to 2020 reiterates that biodiversity loss and climate change are intrinsically linked and states that "Ecosystem-based approaches to climate change mitigation and adaptation can offer cost-effective alternatives to technological solutions, while delivering multiple benefits beyond biodiversity conservation". Green Infrastructure is seen as an essential means of integrating biodiversity and climate change adaptation, a strategy on Green Infrastructure shall be developed by 2011
Develop guidelines and a set of tools (guidance and exchange of best practices) by the end of 2009 to ensure that the River Basin Management Plans (RBMP) are climate-proofed	**COMPLETED** - The Water Framework Directive provides European countries with a common basis to address water challenges posed by climate change. In particular, the Directive's river basin approach to water management – centred on the establishment and review of river basin management plans every six years, including a Programme of Measures to bring waters to good status, – establishes a mechanism to prepare for and adapt to climate change. The first river basin management plans were required by 22 December 2009.
Ensure that climate change is taken into account in the implementation of the Floods Directive.	Directive 2007/60/EC on the assessment and management of flood risks requires Member States to assess if water courses and coast lines are at risk from flooding, then to map flood risks and to take adequate and coordinated measures to reduce the risk. Work is progressing on a catalogue of good adaptation measures and on the improvement of the information on past floods. The preliminary flood risks assessment due by December 2011 will encompass climate change impacts.
Assess the need for further measures to enhance water efficiency in agriculture, households and buildings	The 2007 Communication on addressing the challenge of water scarcity and drought in the EU set out a number of policy options for addressing water scarcity, including the important roles played by water pricing and land-use planning in incentivising efficient water use. The Policy Review for Water Scarcity and Droughts will be integrated into a planned "Blueprint to safeguard European waters". Studies will help bridge the important knowledge gaps as regards water scarcity & droughts in the EU and will assess what measures are needed to improve water efficiency in various sectors: GAP analysis on water scarcity & droughts; Buildings and water efficiency; Leakage reduction in water distribution networks; Water pricing and saving in agriculture; Water footprinting and product labelling.
Explore the potential for policies and measures to boost ecosystem storage capacity for water in Europe	The Waterframework Directive (WFD) will contribute strongly to improving and maintaining ecosystems and works in order to deliver guidance on the relationship between inland river waterways and Natura 2000, selecting best-practice examples for integrated management, combining nature protection, climate change adaptation and transport navigation measures are ongoing. **ClimWatAdapt** looks into how key sectors. i.e. agriculture, industry, tourism, can adapt in order to counterbalance the effects of floods, water scarcity, droughts and changes in water quantity and aims to provide a sound basis for the assessment of vulnerability and of adaptation measures in the context of water policy, but also other environmental and sectoral policies. A call for evidence, complemented with a service contract for the analysis of costs, benefits and climate proofing of natural water retention measures, as part of the "green infrastructure" approach for flood and water scarcity & droughts prevention has been launched and the assessments will be ready by end-2011,
Draft guidelines by 2010 on dealing with the impact of climate change on the management of Natura 2000 sites	As the establishment phase is nearing completion the focus is increasingly on the management and restoration of sites in the network, and on its overall ecological coherence. A study on Biodiversity and Climate Change in relation to Natura 2000 was conducted. The guidelines on Natura 2000 and climate change will assess current knowledge of risk from climate change to species and habitats of EU conservation concern protected by the network, as well setting out on approaches to reduce, mitigate and adapt to such impacts, both within the sites and at broader network level. It will also look at the benefits arising from management and restoration of Natura 2000 sites to climate change mitigation and adaptation. Further assisting guidelines will help dealing with the impact of climate change on the management of Natura 2000.
Explore the potential for policies and measures to boost soil storage capacity for both carbon and water in Erope	The fight against soil degradation and, in particular, the loss of soil organic matter and soil biodiversity, is dealt with via the Soil Thematic Strategy (STS) and the proposed Soil Framework Directive (SFD). **CLIMSOIL** shows the inter-relationship between soil and climate change and **SOCO** assessed a range of soil conservation practices, including from the perspective of keeping organic matter levels. Possible ways to strengthening and support soil measures within the framework of the CAP will be addressed as part of the post-2013 reform. A document is currently under preparation which is supposed to provide competent authorities in Member as well as stakeholders with a useful tool containing relevant information which could be used from awareness raising to planning, from

Action	EU Action – current status and plans
	implementing mitigation measures to providing a check-list for development projects. It is based on the approach consisting of limiting, mitigating, and compensating the effects of soil sealing.
d) Coastal and marine areas	
Ensure that adaptation in coastal and marine areas is taken into account in the framework of the Integrated Maritime Policy, in the implementation of the Marine Strategy Framework Directive and in the reform of the Common Fisheries Policy.	In addressing maritime activities from a cross-sectoral perspective, the **EU Integrated Maritime Policy** provides a comprehensive framework to better understand the impacts of climate change in coastal and maritime areas and integrate measures on climate change adaptation at EU level. A Communication on climate change adaptation in coastal regions and maritime sectors is planed to be adopted in 2012. The EU Integrated Maritime Policy is implemented at the level of sea basins and specific strategies on maritime affairs have been already developed for the Baltic and Mediterranean Sea. A strategy for the Atlantic Ocean is underway. The **Marine Strategy Framework Directive** will facilitate adaptation to climate change by ensuring that climate change considerations are incorporated into Member States' marine strategies while providing a mechanism for regular updating of the marine strategies to take account of new information. The **Common Fisheries Policy** is currently subjected to a root-and-branch overhaul with a view, in particular, to rebuild stocks to levels capable to produce maximum sustainable yield. Increasing the size of fish stocks and their productivity will make them less vulnerable to external factors like climate change. A more coherent and integrated approach to coastal planning and management via **integrated coastal zone management** (ICZM) will assist adaptation in coastal and marine areas. The ICZM Recommendation (2002/413/EC) provides for Member States to take a strategic approach to the management of their coastal zones. Adaptation to climate change is a priority theme for the further promotion of ICZM.
Develop European guidelines on adaptation in coastal and marine areas	The guidelines will contribute to ensuring a coordinated and integrated approach to adaptation in coastal and marine areas. The guidance will take account of and build on existing studies, research and relevant policy initiatives, in particular the Community strategy on disaster prevention, the Floods directive, the **EUrosion** study and the study on the Costs of coastal defence and adaptation. **OURCOAST** is an initiative to support and implement sustainable coastal planning and management. It includes building up a database of coastal planning and management practices, with a key focus on adaptation to risks and climate change.
e) Production systems and physical infrastructure	
Take account of climate change impacts in the Strategic Energy Review process	The EU's agenda for 2020 has set out the essential first steps in the transition to a high-efficiency, low-carbon energy system. The EU needs to develop a vision for 2050 and a policy agenda for 2030. The fundamental technological shifts involved in decarbonising the EU electricity supply, ending oil dependence in transport, low energy and positive power buildings, a smart interconnected electricity network will only happen with a coordinated agenda for research and technological development, regulation, investment and infrastructure development. In addition, the transition to a high efficiency, low-carbon energy system needs to be promoted not only in Europe but worldwide. The Commission is also preparing an Energy Roadmap towards 2050 to be adopted later in 2011.
Develop methodologies for climate-proofing infrastructure projects and consider how these could be incorporated into the TEN-T and TEN-E guidelines and guidance on investments under Cohesion policy in the current period	The 2008 Green Paper on infrastructure was designed to encourage a reflection on how energy networks should develop in the coming years, amongst others, to reflect the new climate change and energy policy. The Commission is currently working on a comprehensive energy infrastructure package. Elements such as increasing resilience of energy transmission infrastructure to cope with extreme weather condition, positioning of over-head power lines, impacts of climate change on LNG infrastructure will be examined in the TEN-E revision process. The TEN-T programme consists of hundreds of projects whose ultimate purpose is to ensure the cohesion, interconnection and interoperability of the trans-European transport network, as well as access to it.
Explore the possibility of making climate impact assessment a condition for public and private investment	In the discussions on the future Cohesion Policy the inclusion of climate proofing as a horizontal condition for all investments is ongoing. Including climate proofing provisions in EU co-financed programmes could be exemplary for national and local public investments and for private sector take-up.
Assess the feasibility of incorporating climate impacts into construction standards, such as Eurocodes	The Eurocodes are currently taken up by the Member States and several have already fully replaced their previous national codes with the Eurocodes. In principle Member States are supposed to have the Eurocodes in place since the beginning of 2011.
Develop guidelines by 2011 to ensure that climate impacts are taken into account in the EIA and SEA Directives	The Commission has decided to develop practical guidance and recommendations for integrating climate change and biodiversity into EIA/SEA procedures to assist EIA/SEA practitioners in taking full advantage of EIA and SEA in achieving EU climate change and biodiversity goals. It is expected that the Commission Guidance should be available at the beginning of 2012 after necessary review.

Action	EU Action – current status and plans
3) Instruments – Financing	
Estimate adaptation costs for relevant policy areas so that they can be taken into account in future financial decisions	**CLIMATECOST** will include estimates of adaptation costs and benefits for Europe in the following sectors: Coasts and tourism, Agriculture and water, Energy consumption and production, Infrastructure and extremes (floods & storms), Health, Ecosystems and forests. A **methodological study** finalised at the beginning of 2011addresses the typology of adaptation actions, the methodology to project future adaptation costs and the methodology to estimate spending on adaptation.
Further examine the potential use of innovative funding measures for adaptation	The Commission is exploring possibilities for the future LIFE+ instrument to address adaptation issues. The instrument would among other issues finance adaptation actions and would be managed in an innovative manner.
Explore the potential for insurance and other financial products to complement adaptation measures and to function as risk sharing instruments	A study on applying economic instruments for adaptation to climate change was finalised in 2011 which explored the application of the following instruments: Risk Management Instruments, Market Based Instruments, Public Private Partnerships. The application of the instruments is analysed from two perspectives: Promoting adaptation to climate change and sharing (transferring) the risks of climate change.
Encourage Member States to utilise the EU ETS revenues for adaptation purposes	The possibility of using revenue generated from auctioning allowances under the EU ETS for adaptation purposes should be utilised. The revised Directive governing the scheme from 2013 provides that at least 50% of the revenue generated from auctioning allowances should be used, inter alia for adaptation in Member States and developing countries. This additional revenue will be crucial for sharing adaptation costs between the public and private sector.
Examine the feasibility of collecting data on climate change expenditure (mitigation and adaptation) as part of the system of environmental accounts	The information on national expenditure related to climate change adaptation can be useful in evaluating the measures taken by Member States to address adaptation. Eurostat is investigating the feasibility of identifying such information on the basis of existing statistical classifications and administrative data in environmental protection expenditure accounts. The results of the study are to be used as a basis for further elaborating the precise statistical methodology for setting up an account on adaptation expenditure.
4) Partnership with the Member States	
Establish an Impact and Adaptation Steering Group (IASG) to step up cooperation on adaptation	In order to assist the Commission in developing its approach to dealing with adaptation, the Adaptation Steering Group was established in September 2010. This Group brings together Member States and a diverse range of stakeholders and is giving guidance about the work on mainstreaming of Adaptation into various EU policies and other issues. The Group is also supposed to assist the COM in the establishment of the 2013 Adaptation Strategy.
further development of National/Regional Adaptation Strategies considering mandatory strategies from 2012	The Commission is currently in the process of establishing an EU Adaptation Strategy which is supposed to be adopted in 2012. Currently 10 Member States have adopted a national adaptation strategy; several Member States are in the process to do so.
5) External dimension and UNFCCC	
Step-up efforts to mainstream adaptation into all EU external policies and strengthen dialogue with partner countries on adaptation issues	Bilateral and regional financial assistance programmes will aim to integrate adaptation considerations into all relevant sectors. The proposed review of the EU Environment Integration Strategy presents a good opportunity to emphasise the need for integrating adaptation needs, as will the Mid-Term Review of EC cooperation strategies. The EU is strengthening its analysis and early warning systems and integrating climate change into existing tools such as conflict prevention mechanisms and security sector reform. Adaptation is also being brought into the dialogue with European Neighbourhood Policy (ENP) partner countries and the regular "Energy, Transport, Environment" sub-committees offer a forum for structured dialogue.
Framework for Action on Adaptation in the UNFCCC	The EU is taking an active role in the negotiations to ensure adaptation issues are adequately dealt with in a post 2012 agreement.

Table 16: Policy actions beyond mainstreaming activities as mentioned in the White Paper of Adaptation

Policy option/Action	Timeline	Related Policy documents	Related adaptation measures
Commission Recommendation on Research joint programming initiative 'Connecting Climate Knowledge for Europe'	tentative: Adoption end of Oct. 2011, targeted for Council meeting 5 Dec 2011	Commission Recommendation and Staff Working Paper	1) Improve climate predictability, 2) Developing climate services, 3) Understanding societal transformation and 4) Improving decision-making
Set up of a GMES (Global Monitoring for Environment and Security) Climate Service. The service will be based on satellite and in-situ monitoring data, Modelling of the entire Earth system, including Model reanalysis and data assimilation. Specific services for Impact assessment (Indicators) and Attribution will be included	June 2011: Conference on user requirements. Service active not before 2014	Documents related to GMES activities	No adaptation measures, but the Service will support Adaptation policy (i.e. the EU Adaptation Clearinghouse Mechanism)
Communication on climate change adaptation in coastal areas and maritime sectors	2012	2013 EU Strategy on Climate Change Adaptation 2007 Blue Book on Integrated Maritime Policy 2010 Report from the EU Parliament on the EU Integrated Maritime Policy	See table 14

Technical notes

(1) The Annual European Union greenhouse gas inventory 1990–2009 and inventory report 2011 (EEA, Technical report No 2/2011).

(2) For further information see the EEA website: http://www.eea.europa.eu/themes/climate

(3) Based on MS submissions until 31 of May 2011 under the Monitoring Mechanism Decision 280/2004/EC and PRIMES/GAINS projections for Bulgaria, Portugal and Romania.

For further details on PRIMES-GAINS projections and its underlying methodology see COMMISSION STAFF WORKING DOCUMENT accompanying the COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS: Analysis of options to move beyond 20% greenhouse gas emission reductions and assessing the risk of carbon leakage {COM(2010) 265 final}. Background information and analysis, Part II. SEC(2010) 650, Brussels, 26.5.2010; Höglund-Isaksson, L., W. Winiwarter, F. Wagner, Z. Klimont and M. Amann: Potentials and costs for mitigation of non-CO2 greenhouse gas emissions in the European Union until 2030. Update 2010, May 2010, http://ec.europa.eu/environment/climat/pdf/climat_action/non_co2emissions_may2010.pdf; European Commission, DG Energy: EU energy trends to 2030 — UPDATE 2009, September 2010.

(4) The six corresponding legislative acts were published in the Official Journal of the European Union in June 2009 (5.06.2009 L 40), and are already in force.

Directive 2009/29/EC expands, strengthens and improves the functioning of the EU ETS post-2012. From 2013 an emission cap will be set at EU level and cut each year to reach -21% in 2020 (comparing to 2005 levels). The auctioning system of allowances will be increased and ambitious ex-ante benchmark for free allocation will be introduced. Industrial installations not subject to carbon leakage will be required to buy 20% of allowances in 2013 rising to 70% in 2020 and 100% in 2027, while those identified to be exposed to the risk of carbon leakage will receive 100% of the quantity determined by benchmarks for free. Use of offset credits from outside of the EU is allowed but this amount remains below half of the reduction effort in order to ensure a sufficient level of emissions reductions inside the EU. (OJ 5.06.2009 L 140)

Decision 406/2009/EC sets national commitments to reduce GHG emissions which are outside the scope of the EU ETS (small-scale emitters: transport, buildings, agriculture, waste), which represent some 60% of total GHG emissions in the EU. The decision sets legally binding annual targets in the period 2013-2020 for each MS ensuring that by 2020 emissions from these sectors will be reduced at EU level by 10% comparing to 2005 levels. The efforts (targets ranging from -20% to +20%) are shared between MS according to differences in GDP per capita. Less wealthy Member States will be allowed to increase their emissions in non-ETS sectors by up to 20% above 2005 levels. These targets do, however, still represent a cap on their emissions and will still require a reduction effort compared to business as usual. By contrast, the wealthier Member States, with GDP/capita above the EU average, will have to reduce emissions, up to a maximum figure of -20% below 2005. (OJ 5.06.2009 L 140)

Directive 2009/28/EC on the promotion of the use of renewable energy sets legally binding targets for each Member State in order to reach the EU target of 20% share of renewable energy in the EU's final energy consumption and 10% share in transport by 2020. (OJ 5.06.2009 L 140)

Directive 2009/31/EC on geological storage of CO2 provides a legal framework to manage possible environmental risks and liability issues and includes a long-term incentive for investment in demonstration projects to capture and geologically store CO2. (OJ 5.06.2009 L 140)

Regulation (EC) No 443/2009 sets standards for CO2 emissions from new passenger cars, which will ensure that emissions from the new car fleet are reduced to an average of 130g CO2/km by 2015. A stringent long-term target of 95g CO2/km by 2020 was also set. Estimate of total GHG emission savings per year amounts to 50 Mt CO2 eq. (OJ 5.06.2009 L 140)

Fuel quality directive 2009/30/EC puts an obligation on suppliers to reduce greenhouse gas emission from entire fuel production chain by 6% by 2020. A review in 2012 will consider increasing the target to 10% by 2020. Estimate of total GHG emission savings per year amounts to 62.5 Mt CO2-eq. (OJ 5.06.2009 L 140)

(5) Or 30% if the conditions are right (other major emitting countries in the developed and developing worlds commit to do their fair share under a future global climate agreement)

(6) Commission Decision 2010/634/EU of 22 October 2010 adjusting the Union-wide quantity of allowances to be issued under the Union Scheme for 2013 (OJ 23.10.2010 L 279/34)

(7) Commission Regulation (EU) No. 1031/2010 of 11 November 2010 on the timing, administration and other aspects of auctioning of greenhouse gas emission allowances pursuant to Directive 2003/87/EC of the European Parliament and of the Council establishing a scheme for greenhouse gas emission allowances trading within the Community (OJ 18.11.2010 L 302/1)

(8) Commission Decision 2011/278/EU of 27 April 2011 determining transitional Union-wide rules for harmonised free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC (OJ 17.5.2011 L 130/1)

(9) Commission Decision 2010/670/EU of 3 November 2010 laying down criteria and measures for the financing of commercial demonstration projects that aim at the environmentally safe capture and geological storage of CO_2 as well as demonstration projects of innovative renewable energy technologies under the scheme for greenhouse gas emission allowance trading within the Community established by Directive 2003/87/EC of the European Parliament and of the Council. (OJ 6.11.2010 L 290/39)

(10) The Commission Regulation (EU) 550/2011 of 7June 2011 on determining, pursuant to Directive 2003/87/EC, certain restrictions applicable to the use of international credits from projects involving industrial gases (OJ 8.6.2011 L 149/1.)

(11) Commission Regulation (EU) No 394/2011 of 20 April 2011 amending Regulation (EC) No 748/2009 on the list of aircraft operators that performed an aviation activity listed in Annex I to Directive 2003/87/EC of the European Parliament and of the

Council on or after 1 January 2006 specifying the administering Member State for each aircraft operator as regards the expansion of the Union emission trading scheme to EEA-EFTA countries (OJ 27.4.2011 L 107/1)

(12) Commission Regulation (EU) No 1014/2010 of 10 November 2010 on monitoring and reporting of data on the registration of new passenger cars pursuant to Regulation (EC) No 443/2009 of the European Parliament and of the Council (OJ 11.11.2010 L 293/15)

(13) Commission Regulation (EU) No 63/2011 of 26 January 2011 laying down detailed provisions for the application for a derogation from the specific CO_2 emission targets pursuant to Article 11 of Regulation (EC) No 443/2009 of the European Parliament and of the Council (OJ 27.1.2011 L 23/16)

(14) Regulation (EU) No 510/2011 of the European Parliament and of the Council of 11 May 2011 setting emission performance standards for new light commercial vehicles as part of integrated approach to reduce CO_2 emissions from light-duty vehicles. (OJ 31.5.2011 L 145/1)

(15) CITL, April 2011

(16) The revised directive on EU ETS allows existing operators (from 2013) to use JI and CDM credits in such a way that the overall use of credits is limited to 50% of the EU-wide reductions below the 2005 levels over the period 2008-2020 and for new sectors and aviation 50% of the reductions below the 2005 levels over the period from the date of their inclusion in the EU ETS to 2020. This amounts to an overall JI/CDM limit of roughly 6.5% of the EU-wide cap over the period 2008-2020.The exact limits for each installation will still need to be determined but the Directive already grants to existing operators an access to credits of at least of 11% of their allocation during the period 2008-2012. In addition, new entrants and new sectors including aviation receive minimum levels of access to JI and CDM credits.

(17) Base year level of GHG emissions for Croatia has not been decided yet, however Croatia formally notified the UNFCCC to withdraw its appeal against the decision of the Executive Branch of the Compliance Committee

(18) Second ECCP progress report April 2003 http://europa.eu.int/comm/environment/climat/pdf/second_eccp_report.pdf

(19) Directive on the promotion of energy from renewable sources, Citizens' Summary, 23 January 2008

(20) The original figure refers to a cumulative estimate of 7 MtCO2eq by 2020.

(21) Proposal for a Directive of the European Parliament and of the Council on the promotion of cogeneration based on a useful heat demand in the internal energy market

(22) COM (2005) 628 final “Biomass Action Plan, December 2005”

(23) Decision No 1229/2003/EC, Regulation (EC) No 807/2004, Directive 2003/54/EC & 2003/55/EC, Regulation (EC) No 1228/2003

(24) COM (2004)366 – final "The share of renewable energy in the EU, May 2004

(25) Energy performance of buildings – impact assessment on the revised directive SEC(2008) 2864

(26) Proposal for a Directive of the European Parliament and of the Council on End-Use Energy Efficiency and Energy Services, COM(2003) 739 final

(27) COM(2006)545 – final "Action Plan for Energy Efficiency: Realising the Potential"

(28) Questions and answers on the EU strategy to reduce CO2 emissions from cars, MEMO/07/46.

(29) Questions and answers on the EU strategy to reduce CO2 emissions from cars, MEMO/07/46.

(30) Inclusion of Aviation in the EU Greenhouse Gas Emissions Trading Scheme (EU ETS), Summary of the Impact Assessment, SEC(2006) 1685

(31) Directive on the promotion of clean and energy efficient road transport vehicles, 2005/0283 (COD)

(32) Regulation proposal on certain fluorinated greenhouse gases, COM (2003) 492 final; estimated emissions reductions are due to both the implementation of F-gases Regulation (842/2006) and the MAC Directive (2006/40/EC- for air conditioning systems in motor vehicles)

(33) Thematic Strategy on Waste Prevention, COM (2005) 666 and 667 (final)

(34) Value in 2011 - Directive on waste electrical and electronic equipment (WEEE), (recast) Impact Assessment, {COM(2008) 810}, {SEC(2008) 2933}

(35) From ECCP working group on agriculture and sub-group on carbon sinks related to agricultural soils. Some of potential for bioenergy crops will be covered within potential from biofuels, cogeneration from biomass, further promotion of RES-H etc.

(36) EEA, 2008, GHG Trends and Projections in Europe http://www.eea.europa.eu/publications/eea_report_2008_5/TPReport2008Annexes.pdf

(37) Thematic Strategy for Soil Protection, COM(2006)231

(38) This figure is based on the 2010 proxy estimate of total EU-27 GHG emissions. For further information see the EEA website: http://www.eea.europa.eu/themes/climate

(39) The Package introduced some further differences in comparison to the UN rules including the following: no recognition of AAUs, exclusion of the LULUCF sector, more restrictive CDM policy, annual compliance, broader coverage of sectors.

(40) Report from the Commission on the application, effects and adequacy of the Regulation on certain fluorinated greenhouse gases (Regulation (EC) No 842/2006)