

Spain

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1. SOURCES OF INFORMATION

- Spain's 4th National Communication under the United Nations Framework Convention and its Kyoto Protocol
- Spain's communication under the monitoring mechanism submitted on 16 March 2007.
- Spain's additional information under Decision 280 submitted on June 2007
- Spain's National Allocation Plan 2008-2012, submitted to the EU Commission on 25 November 2006, approved by the Commission on 26 February 2007

Base-year emissions

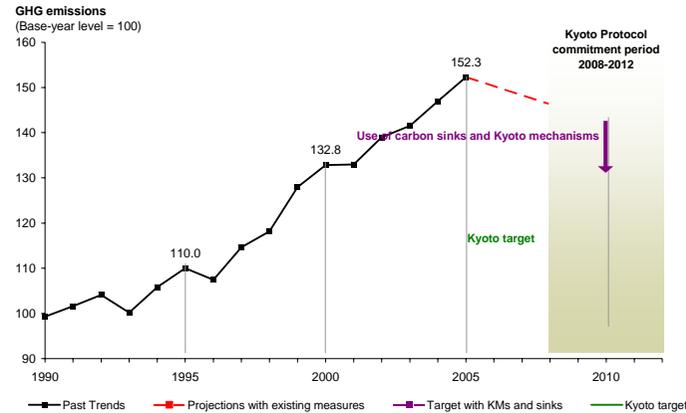
Base-year emissions of greenhouse gases are calculated using 1990 emissions for carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) and 1995 emissions for fluorinated gases (SF₆, HFCs and PFCs).

Base-year data used in this country profile is as reported by the Member State in the sources noted above. The base year data is 3.4 Mt CO₂ eq lower than the data reported in *The European Community's initial report under the Kyoto Protocol - Report to facilitate the calculation of the assigned amount of the European Community pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol (Submission to the UNFCCC Secretariat)*, EEA Technical report No 10/2006. This data is currently undergoing a review procedure by UNFCCC and is therefore subject to change.

2. SUMMARY

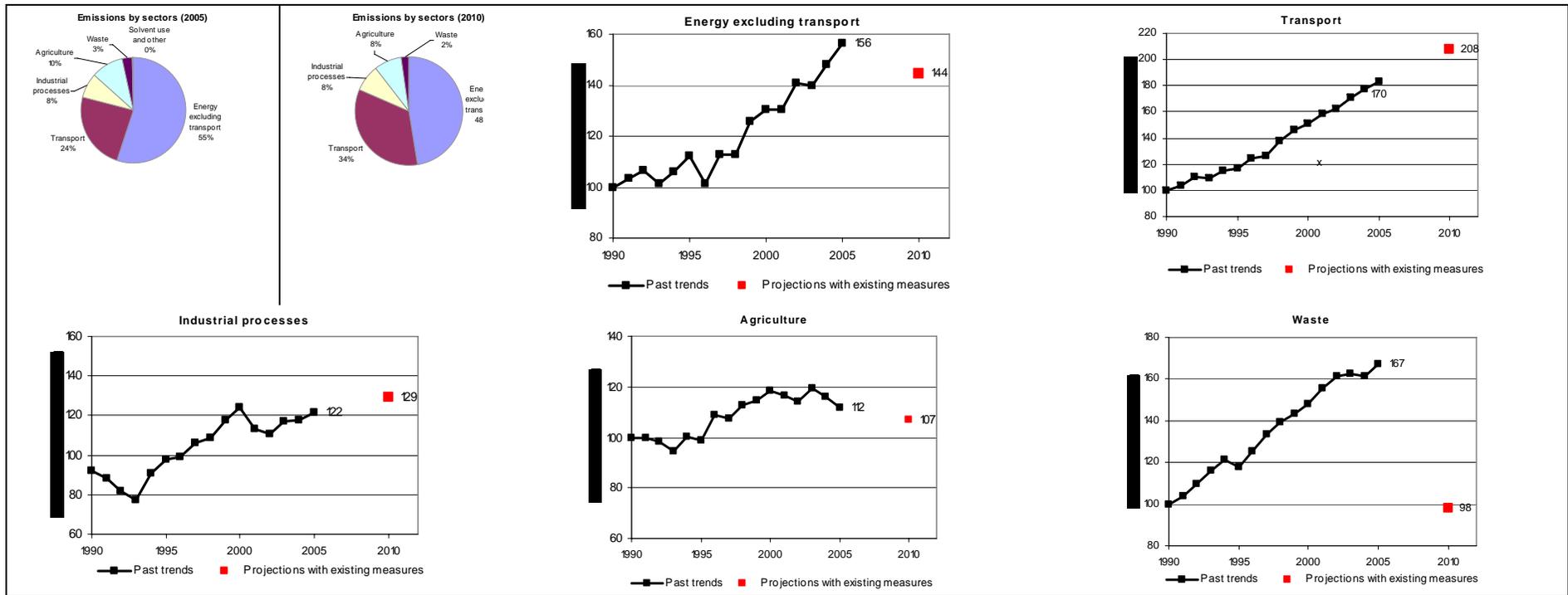
SPAIN

Share in total EU-15 GHG emissions 2005	10.5 %
Emissions base year (initial report)	289.4 Mt
Emissions 2005	440.6 Mt
Emissions base year (for projections)	288.4 Mt
Projections 2010 with existing measures	436.3 Mt
+ ETS effect	410.2 Mt
No projections with additional measures	n.a.
Kyoto target (absolute, based on latest inventory)	332.8 Mt
Kyoto target (% from base year)	+ 15.0 %
Change base year to 2005	+ 52.3 %
Change 2004–05	+ 3.6 %
Change base year to 2010 with existing measures	+ 51.3 %
+ ETS effect	+ 42.3 %
No projections with additional measures	n.a.
Distance to linear target path 2005+31.3 (+41.0) index points	
Use of Kyoto mechanisms	31.8 Mt
Sinks (Articles 3.3 and 3.4)	5.8 Mt
Emissions in 1990 (Article 3.7)	n.a.

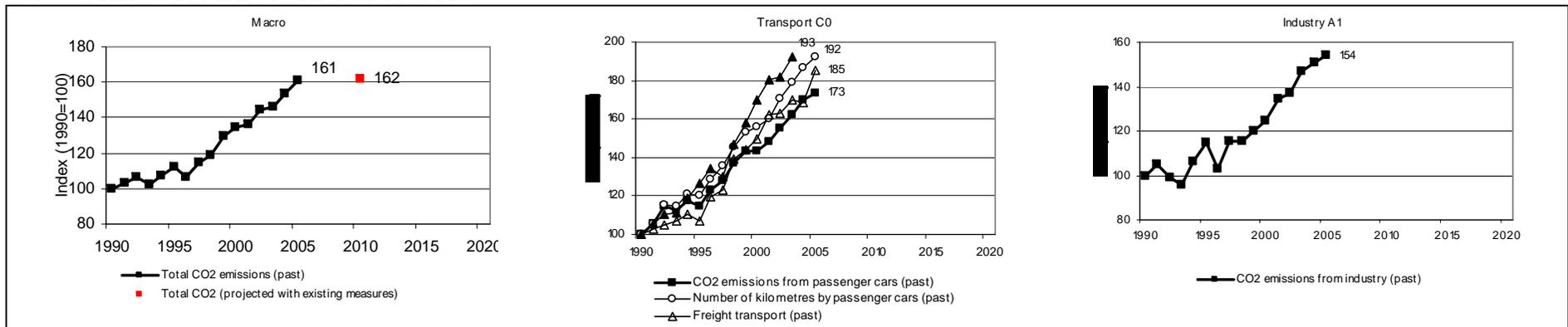


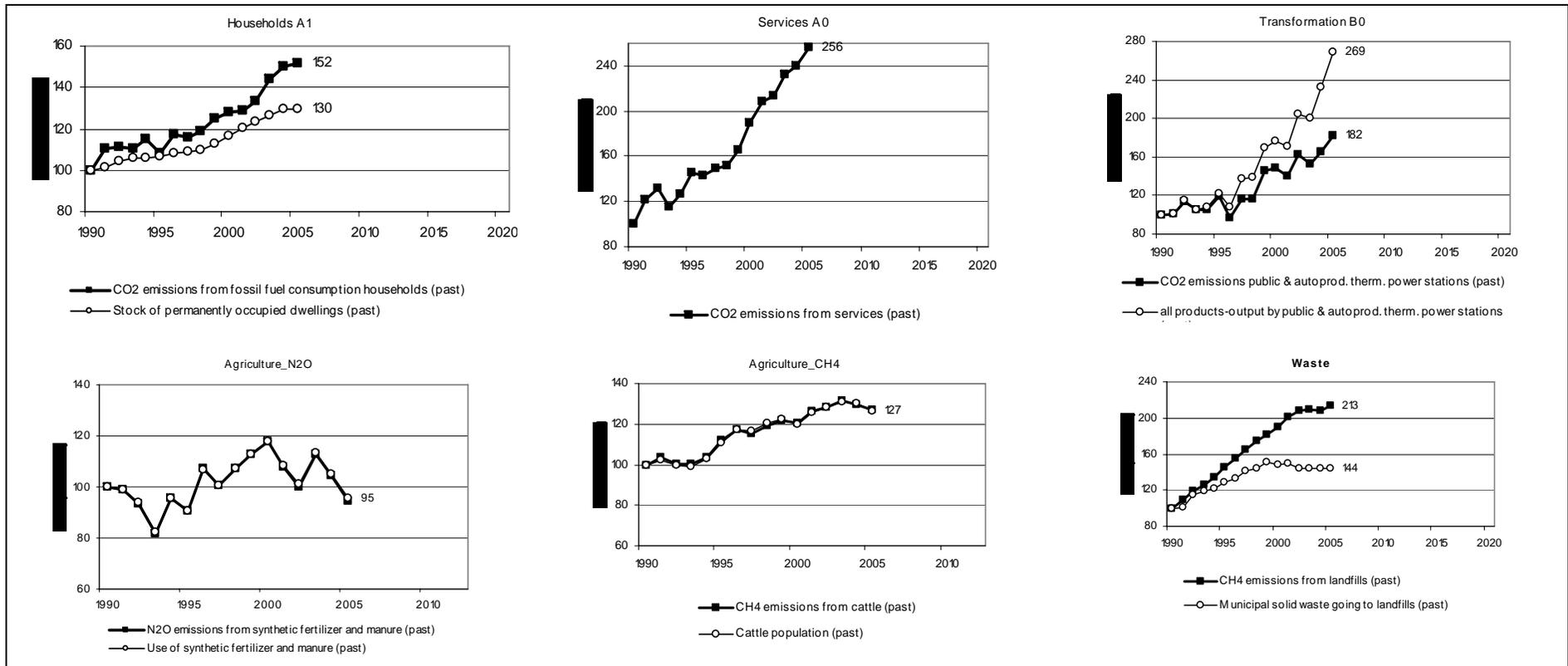
Past emissions: Spain's GHG emissions were 3.6 % above those of 2004 and 52.3 % above base-year levels in 2005. Increases between 2004 and 2005 were mainly due to increasing fossil fuel combustion from public power and heat production (partly driven by lower hydro power production) and growing road transportation. Between 1990 and 2005, again fuel consumption in electricity and heat production and road transport are the largest contributors to emission increases. Also emissions from industry, households and services, landfills and agriculture increased substantially.

Emission projections: Emissions in 2005 were ten percentage points above the level projected with existing measures (including the ETS effect) for 2010. Spain will not achieve the Kyoto target with domestic measures. Therefore, Spain is currently planning to use Kyoto mechanisms to purchase an average of 31.8 million tonnes of CO₂ equivalent reductions per year during the commitment period and to make use of carbon sinks of 5.8 million tonnes. However, also the use of Kyoto Mechanisms and carbon sinks will leave a gap to the Kyoto target of about 14 percentage points.



3. REPORTED INDICATORS





Priority Indicators		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Macro	Total CO ₂ emissions, kt	228,517	235,374	242,368	233,113	244,853	255,585	242,981	262,646	270,739	296,317	307,674	311,550	330,550	334,534	351,816	368,282
	GDP, Bio Euro (EC95)	-	-	-	-	-	447	458	476	497	521	547	567	582	600	619	641
Macro B0	CO ₂ emissions from energy consumption, kt	205,415	212,989	221,713	212,826	222,266	233,240	220,812	239,267	245,787	270,477	280,685	284,287	302,328	306,101	322,490	337,908
	GDP, Bio Euro (EC95)	-	-	-	-	-	447	458	476	497	521	547	567	582	600	619	641
Transport C0	CO ₂ emissions from passenger cars, kt	27,756	29,282	31,823	31,276	32,657	31,920	34,237	35,541	38,115	39,727	39,722	41,145	43,177	45,112	47,115	48,156
	Number of kilometres by passenger cars, Mkm	142,197	150,352	163,709	163,387	172,464	171,332	183,170	192,722	206,387	217,715	221,535	227,958	242,609	254,123	265,884	273,129
Industry A1	CO ₂ emissions from industry, kt	46,266	48,586	45,662	44,167	49,297	53,094	47,723	53,293	53,305	55,634	57,790	62,073	63,492	67,859	69,707	71,179
	Gross value-added total industry, Bio Euro (EC95)	-	-	-	-	-	106	108	113	120	128	134	141	144	147	150	154
Households A1	CO ₂ emissions from fossil fuel consumption households, kt	12,979	14,374	14,457	14,298	14,915	14,023	15,194	15,063	15,456	16,249	16,582	16,725	17,335	18,675	19,513	19,675
	Stock of permanently occupied dwellings, 1000	11,201	11,368	11,697	11,891	11,889	11,934	12,111	12,187	12,263	12,672	13,086	13,468	13,843	14,187	14,528	14,528
Services A0	CO ₂ emissions from fossil fuel consumption in commercial and institutional sector, kt	3,745	4,537	4,945	4,327	4,724	5,447	5,340	5,582	5,686	6,219	7,100	7,805	7,982	8,709	8,974	9,590
	Gross value-added services, Bio Euro (EC95)	-	-	-	-	-	256	294	337	384	433	484	525	559	587	613	635
Transformation B0	CO ₂ emissions from public and autoproducer thermal power stations, kt	66,185	67,278	74,984	69,288	69,910	78,843	64,217	76,780	76,667	96,570	98,306	93,193	107,557	101,334	109,800	120,585
	All products - output and autoproducer thermal power stations, PJ	257	259	295	269	278	312	277	354	357	437	453	438	527	514	599	693
Additional Priority Indicators		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Transport D0	CO ₂ emissions from freight transport on road, kt	19,891	20,991	21,925	22,103	23,607	25,113	26,692	25,903	29,158	31,404	33,800	35,953	36,197	38,299	39,549	40,745
	Freight transport on road, Mtkm	198,635	204,835	208,235	211,835	219,935	213,002	237,933	244,023	276,284	286,048	297,596	322,637	324,183	337,948	334,081	367,497
Industry A1.1	Total CO ₂ emissions from iron and steel, kt	10,881	11,583	9,763	9,935	12,435	10,978	9,562	10,676	8,902	8,627	8,544	9,745	9,286	8,987	10,254	10,996
	Gross value-added - iron and steel industry, Bio Euro (EC95)	-	-	-	-	-	3	2	3	3	3	3	3	3	3	3	3
Industry A1.2	Energy related CO ₂ emissions chemical industries, kt	5,458	6,452	6,271	5,785	6,915	8,369	6,287	6,857	6,303	6,267	7,182	7,557	8,151	8,912	9,647	9,355
	Gross value-added - chemical industry, Bio Euro (EC95)	-	-	-	-	-	7	7	8	8	8	8	9	9	9	9	9
Industry A1.3	Energy related CO ₂ emissions - glass pottery and building materials industry, kt	16,098	16,260	15,826	13,625	14,498	15,757	16,300	17,605	19,059	20,269	21,102	22,222	22,094	23,894	22,653	22,781
	Gross value added - glass pottery and building materials industry, Bio Euro (EC95)	-	-	-	-	-	6	6	6	7	7	7	8	8	8	8	9
Industry C0.1	Total CO ₂ emissions from iron and steel, kt	10,881	11,583	9,763	9,935	12,435	10,978	9,562	10,676	8,902	8,627	8,544	9,745	9,286	8,987	10,254	10,996
	Production of oxygen steel	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Industry C0.2	Energy related CO ₂ emissions from glass, pottery and building materials, kt	16,098	16,260	15,826	13,625	14,498	15,757	16,300	17,605	19,059	20,269	21,102	22,222	22,094	23,894	22,653	22,781
	Cement production, kt	27,395	26,768	23,885	22,210	24,622	25,840	24,577	27,010	31,311	34,800	37,104	39,301	40,414	41,530	42,440	44,272

Supplementary Indicators		1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Transport B0 (diesel)	CO ₂ emissions of diesel-driven cars, kt	4,537	4,946	5,591	5,851	6,441	7,296	7,998	9,498	11,891	13,594	14,659	16,407	18,702	21,067	23,937	26,167
	Number of km, of diesel-driven passenger cars, Mio km	25,449	27,466	30,850	32,695	36,268	40,969	45,285	53,876	66,516	76,419	83,540	92,343	105,325	118,221	133,226	144,406
Transport (B0) (petrol)	CO ₂ emissions of petrol-driven cars, kt	23,140	24,215	26,080	25,243	26,020	24,400	26,009	25,801	25,967	25,906	24,836	24,520	24,258	23,830	22,964	21,853
	Number of km, of petrol-driven passenger cars, Mio km	116,340	122,260	132,077	129,730	135,149	129,169	136,663	137,544	138,491	140,057	136,756	134,424	136,094	134,727	131,485	127,982
Transport C0	CO ₂ emissions from passenger cars, kt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Passenger transport by cars, Mpkm	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transport E1	CO ₂ emissions from domestic air transport, kt	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Domestic air passenger, Mio	35,240,336	37,290,988	39,735,822	36,319,502	38,050,248	39,842,886	43,068,016	46,581,132	47,783,017	52,134,922	58,830,758	60,375,712	58,994,801	63,851,167	69,461,032	-
Industry A1.4	Energy related CO ₂ emissions food industry, kt	3,376	3,545	3,566	3,714	4,249	5,325	4,132	4,482	4,461	5,303	4,902	5,376	5,913	6,139	6,215	6,255
	Gross Value Added food, drink and tobacco industry, Mio EUR (EC95)	-	-	-	-	-	13,481	12,849	13,481	13,865	14,242	14,119	14,154	13,991	14,206	14,301	14,515
Industry A1.5	Energy related CO ₂ emissions - paper and printing industry, kt	3,212	3,185	3,051	3,205	3,646	4,045	3,639	4,123	4,483	4,912	5,295	4,648	5,240	6,222	5,611	5,998
	Gross value added paper and printing industry, Mio EUR (EC95)	-	-	-	-	-	7,297	7,556	7,907	8,214	8,526	9,366	9,484	9,960	10,499	11,288	12,451
Households A0	Surface area of permanently occupied dwellings, Mio m ²	6,490	7,187	7,229	7,149	7,458	7,011	7,597	7,532	7,728	8,125	8,291	8,363	8,668	9,338	9,757	9,837
	Specific CO ₂ emissions of households for space heating, t/m ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Services B0	CO ₂ emissions from space heating in commercial and institutional, kt	3,370	4,084	4,450	3,895	4,252	4,902	4,806	5,024	5,118	5,597	6,390	7,025	7,184	7,838	8,076	8,631
	Surface area of services buildings, Mio m ²	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Transformation D0	CO ₂ emissions from public thermal power stations, kt	64,341	65,021	72,581	66,832	65,842	71,633	58,825	70,429	69,516	85,388	89,776	84,245	98,191	91,082	99,637	110,032
	All products output by public thermal power stations, PJ	246	249	282	254	250	277	227	282	273	333	353	334	410	396	460	-
Transformation E0	CO ₂ emissions from autoproducer, kt	1,843	2,256	2,404	2,457	4,068	7,210	5,392	6,351	7,151	11,182	8,530	8,948	9,366	10,252	10,163	10,553
	All products output by autoproducer thermal power stations, PJ	11	10	13	15	28	36	50	72	83	104	99	104	117	119	138	-
Transformation	CO ₂ emissions from classical power production, kt	66,185	67,278	74,984	69,288	69,910	78,843	64,217	76,780	76,667	96,570	98,306	93,193	107,557	101,334	109,800	120,585
	All products output by public and autoproducer power stations, PJ	544	557	564	560	579	596	624	681	696	741	800	840	870	929	998	1,046
Transport	CO ₂ emissions from transport, kt	56,512	58,771	62,527	61,802	64,627	65,597	70,144	70,799	77,562	82,181	84,807	88,914	90,977	95,401	99,402	102,436
	Total final energy consumption from transport, PJ	795	827	880	870	912	922	984	994	1,088	1,150	1,189	1,247	1,277	1,339	1,394	1,440
Industry	Energy related CO ₂ emissions paper and printing industries, kt	3,212	3,185	3,051	3,205	3,646	4,045	3,639	4,123	4,483	4,912	5,295	4,648	5,240	6,222	5,611	5,998
	Physical output of paper, kt	3,445	3,426	3,449	3,348	3,501	3,684	3,768	3,968	4,196	4,436	4,764	5,134	5,365	5,434	5,526	5,697
Industry	CO ₂ emissions from the industry sector	46,266	48,586	45,662	44,167	49,297	53,094	47,723	53,293	53,305	55,634	57,790	62,073	63,492	67,859	69,707	71,179
	Total final energy consumption from industry, PJ	864	896	865	849	908	973	920	1,025	1,055	1,122	1,204	1,282	1,318	1,415	1,471	1,520
Households	CO ₂ emissions from households, kt	12,979	12,979	14,374	14,457	14,298	14,915	14,023	15,194	15,063	15,456	16,249	16,582	16,725	17,335	18,675	19,513
	Total final energy consumption from households, PJ	387	408	408	410	427	419	441	449	463	491	493	519	533	566	593	-

4. OVERVIEW OF CCPM IMPLEMENTATION IN MEMBER STATE

Table 1. Information provided on the implementation of policies and measures¹

Sector	CCPM	Spain
Cross-cutting	Kyoto Protocol project mechanisms 2004/101/EC	N
Cross-cutting	Emissions trading 2003/87/EC	N
Cross-cutting	Integrated pollution prevention and control 96/61/EC	N
Energy supply	Promotion of cogeneration 2004/8/EC	N
Energy supply	Taxation of energy products 2003/96/EC	R
Energy supply	Internal electricity market 2003/54/EC	
Energy supply	Promotion of electricity from RE sources 2001/77/EC	R
Energy supply	Internal market in natural gas 98/30/EC	
Energy supply	Emissions from large combustion plants 88/609/EEC	
Energy consumption	Directives on energy labelling of appliances	N
Energy consumption	End-use efficiency and energy services 2006/32/EC	N
Energy consumption	Ecodesign requirements for energy-using products 2005/32/EC	
Energy consumption	Energy performance of buildings 2002/91/EC	R
Energy consumption	Eco-management & audit scheme (EMAS) EC 761/2001	N
Energy consumption	Energy-efficiency labelling for office equipment Regulation No. 2422/2001	
Energy consumption	Efficiency fluorescent lighting 2000/55/EC	
Energy consumption	Efficiency of hot water boilers 92/42/EEC	N
Transport	Environmental performance freight transport (Marco Polo Programme)	
Transport	Motor challenge, voluntary EC programme	
Transport	Promotion of biofuels for transport 2003/30/EC	N
Transport	Integrated European railway area (2nd + 3rd Railway package) (COM(2002)18 final)	
Transport	Transport modal shift to rail 2001/12/EC etc.	N
Transport	Consumer information on cars 1999/94/EC	N
Transport	Agreement with car manufacturers ACEA etc.	
Industrial Process	F-gas regulation (Regulation No 842/2006)	
Industrial Process	Industrial Process: HFC emissions from air conditioning in motor vehicles 2006/40/EC	
Agriculture	Support under CAP (1782/2003)	N
Agriculture	Support under CAP - amendment (1783/2003)	R
Agriculture	Nitrates 91/676/EEC	N
Agriculture	Transition to rural development support No 2603/1999	B
Agriculture	Agricultural production methods compatible with environment Regulation (EEC) No 2078/92	R
Agriculture	Aid scheme for forestry measures in agriculture (Regulation (EEC) No 2080/92)	R
Agriculture	Emission by engines to power agricultural or forestry 2000/25/EC	R
Agriculture	Pre-accession measures for agriculture and rural development Regulation (EC) No 1268/1999	R

¹ Source: Partially contained in Additional Information under Decision 280 sent to the Commission on June 2007 and updated in agriculture sector

Waste	Directive on waste 2006/12/EC	
Waste	Landfill directive 1999/31/EC	R
Waste	Packaging and packaging waste (Directive 94/62/EC, 2004/12/EC, 2005/20/EC)	

Legend

New national PAM implemented after CCPM was adopted

Existing national PAM **re-enforced** by CCPM

National PAM already in force **before** CCPM was adopted

Not reported

N
R
B

Source: MS responses to the CCPMs questionnaire in 2005, 4th National Communication, Comunicación de España a la Comisión Europea 2007

5. COMPLETENESS OF REPORTING

The quality of reporting and information available has increased considerably through the submission of Spain's 4th National Communication. Projections are available for all sectors and gases for the first time and more PAM have been quantified.

Table 2. Information provided on policies and measures

Information provided	Level of information provided	Comments
Policy names	++	In most cases policy names are clear.
Objectives of policies	+++	Good description of the objectives.
Which greenhouse gases?	All	
Status of Implementation	+++	
Implementation body specified	+++	Clearly specified.
Quantitative assessment of implementation	++	Not all PAM quantified, many estimates only on aggregate level for period of several years, different periods chosen for different PAMs
Interaction with other policies and measures discussed	++	Relationship to CCPM included in several cases.

0, +, ++, +++ level of information available increases as the number of + signs increases

Table 3. Information provided on projections

Category of Information	Level of information provided	Comments
Scenarios considered	++	No 'with add. measures' scenario provided
Expressed relative to base year	+++	
Starting year	2000	
Split of projections	+++	7 sectors for CO ₂ , CH ₄ , N ₂ O and for F-gases.
Presentation of results	+++	Tables and graphs by gas and sector
Description of model (level of detail, approach and assumptions)	++	Detailed description of PAM included in scenario, only limited information on assumptions and parameters provided
Sensitivity analysis (key inputs to model / high, central and low projections scenarios / robustness of model)	0	Not reported
Discussion of uncertainty	0	Not discussed
Details of parameters and assumptions	0	Not reported

0, +, ++, +++ level of information available increases as the number of + signs increases

6. ASSESSMENT OF POLICIES AND MEASURES

Table 4. Summary of the effect of policies and measures included in the 2010 projections (Mt CO₂-eq.)

	With measures
Energy (total, excluding transport)	27.5
Public Electricity Generation	10.7
Commercial, Institutional and Residential Combustion Installations	2.7
Industrial Combustion Installations	13.7
Extraction and Distribution of fossil Fuels	0.3
Transport (energy)	3.8
Road transport	2.2
Other transport modes	1.6
Industrial processes	4.2
Solvents and other Product use	7.3
Waste	7.6
Agriculture	7.1
Other Sources & Sinks	1.4
Total (excluding sinks)	58.8

Source: 4th NC

Table 5. Detailed information on policies and measures

Policies and measures in the “with measures” projection

<u>Sector</u>	Projection Scenario	Name	Type	GHG	Status	Absolute Reduction [kt CO ₂ eq. p.a.]			<u>Costs [EUR/t]</u>
						2005	2010	2020	
Cross-cutting		Royal Decree 13/2006	Economic	CO ₂	implemented				
Cross-cutting		Network of Cities for the Climate	Education Information	CO ₂	implemented				
Cross-cutting		National Allocation Plan (NAP) 2005-2007	Economic	CO ₂	implemented	1,860			
Cross-cutting		Carbon Funds	Economic Voluntary/negotiated agreement	CO ₂	implemented		31,800		
Cross-cutting		National Allocation Plan (NAP) 2008-2012	Economic	CO ₂	implemented		26,100		
Cross-cutting		Spanish Carbon Fund (World Bank)	Economic Voluntary/negotiated agreement	CO ₂	implemented				
Cross-cutting		BioCarbon Fund (World Bank)	Economic Voluntary/negotiated agreement	CO ₂	implemented				
Cross-cutting		Community Development Carbon Fund (World Bank)	Economic Voluntary/negotiated agreement	CO ₂	implemented				
Cross-cutting		Iberoamerican Carbon Initiative (CAF)	Economic Voluntary/negotiated agreement	CO ₂	implemented				
Cross-cutting		Multilateral Carbon Credit Fund (BEI-BERD)	Economic Voluntary/negotiated agreement	CO ₂	implemented				
Cross-cutting		Asia Pacific Carbon Fund (ADB)	Economic	CO ₂	implemented				

<u>Sector</u>	Projection Scenario	Name	Type	GHG	Status	Absolute Reduction [kt CO ₂ eq. p.a.]			<u>Costs [EUR/t]</u>
						2005	<u>2010</u>	2020	
			Voluntary/ negotiated agreement						
Cross-cutting		Project "Clarity"	Education Information	CO ₂	implemented				
Cross-cutting		Campaign "You control climate change"	Education Information	CO ₂	implemented				
Cross-cutting		Subsidies programme for awareness raising	Education Information	CH ₄ CO ₂ HFC N ₂ O PFC SF ₆	implemented				
Cross-cutting		Law 27/20056, access to information related to the environment	Regulatory	CH ₄ CO ₂ HFC N ₂ O PFC SF ₆	implemented				
Cross-cutting		National Plan on Research and Development	Research	CO ₂	implemented				
Cross-cutting Energy supply Industrial Processes		Emissions Trading Scheme (Law 1/2005)	Economic	CO ₂	implemented				
Cross-cutting Energy supply Industrial Processes		Emissions Trading Scheme (Law 1/2005)	Economic	CO ₂	implemented				
Energy supply		Renewable Energy Plan (2005 - 2010): extension of the use of thermoelectric solar energy	Economic	CO ₂	implemented		480		
Energy supply		Renewable Energy Plan (2005 - 2010): extension of the use of wind power	Economic	CO ₂	implemented		9,600		
Energy supply		Renewable Energy Plan (2005 - 2010): extension of the use of biomass	Economic	CO ₂	implemented		7,300		

<u>Sector</u>	<u>Projection Scenario</u>	<u>Name</u>	<u>Type</u>	<u>GHG</u>	<u>Status</u>	<u>Absolute Reduction [kt CO₂ eq. p.a.]</u>			<u>Costs [EUR/t]</u>
						<u>2005</u>	<u>2010</u>	<u>2020</u>	
Energy supply		Renewable Energy Plan (2005 - 2010): extension of the use of small hydro power	Economic	CO ₂	implemented		470		
Energy supply		Renewable Energy Plan (2005 - 2010): extension of the use of biogas	Economic	CO ₂	implemented		1,800		
Energy supply		Renewable Energy Plan (2005 - 2010): extension of the use of biofuels	Fiscal	CO ₂	implemented		5,900		
Energy supply		Renewable Energy Plan (2005 - 2010): extension of hydro power	Economic	CO ₂	implemented		260		
Energy supply		Renewable Energy Plan (2005 - 2010): extension of the use of photovoltaics	Economic	CO ₂	implemented		210		
Energy supply		Renewable Energy Plan (2005 - 2010): extension of the use of solar thermal energy	Economic	CO ₂	implemented		1,000		
Energy supply		Planning of the electricity and gas sectors. Revision 2005 - 2011.	Planning Regulatory	CO ₂	implemented				
Energy supply		Strategy for energy saving and efficiency in Spain 2004 - 2012 (E4): Plan of Action 2005 - 2007: energy sector	Economic	CO ₂	implemented	937			
Energy supply		City of Energy	Research	CO ₂	implemented				
Energy consumption		Technical Building Code (CTE) (Royal Decree 314/2006)	Regulatory	CO ₂	implemented				
Energy consumption		Regulation for thermal installations in buildings (RITE)	Regulatory	CO ₂	implemented				
Energy consumption		Energy certification of buildings (Royal Decree 47/2007)	Regulatory	CO ₂	implemented				
Energy consumption		Strategy for energy saving and efficiency in Spain 2004 - 2012 (E4): Plan of Action 2005 - 2007: building sector	Economic	CO ₂	implemented	92			
Energy consumption		Strategy for energy saving and efficiency in Spain 2004 - 2012 (E4): Plan of Action 2005 - 2007: public services sector	Economic	CO ₂	implemented	61			
Energy consumption		Strategy for energy saving and efficiency in Spain 2004 - 2012 (E4): Plan of Action 2005 - 2007: residential equipment and office equipment sector	Economic Regulatory	CO ₂	implemented	90			
Transport		Strategic Plan of Infrastructure and Transport	Regulatory	CO ₂	implemented			30,000	

<u>Sector</u>	<u>Projection Scenario</u>	<u>Name</u>	<u>Type</u>	<u>GHG</u>	<u>Status</u>	<u>Absolute Reduction [kt CO₂ eq. p.a.]</u>			<u>Costs [EUR/t]</u>
						<u>2005</u>	<u>2010</u>	<u>2020</u>	
		(PEIT)							
Transport		Law 48/2003 on the economical operation mode and on harbour services of public interest	Fiscal	CO ₂	implemented				
Transport		Strategy for energy saving and efficiency in Spain 2004 - 2012 (E4): Plan of Action 2005 - 2007: transport sector	Economic Education Planning	CO ₂	implemented	1,407			
Cross-cutting Energy supply Industrial Processes		Emissions Trading Scheme (Law 1/2005)	Economic	CO ₂	implemented				
Industrial Processes		Strategy for energy saving and efficiency in Spain 2004 - 2012 (E4): Plan of Action 2005 - 2007: industry sector	Economic	CO ₂	implemented	89			
Industrial Processes		Law 16/2002 about integrated pollution prevention and control	Regulatory	CO ₂	implemented				
Industrial Processes		Programme for the Promotion of Technical Research (PROFIT)	Economic Research	CO ₂	implemented				
Industrial Processes		Programme "Ingenio 2010"	Research	CO ₂	implemented				
Agriculture		Agricultural geographic information system (GIS)	Information Research	CH ₄ N ₂ O	implemented				
Agriculture		Interaction between agriculture and environment	Research	CH ₄ N ₂ O	implemented				
Agriculture		Agro-environmental requirements by the Common Agricultural Policy	Economic Regulatory	CH ₄ N ₂ O	implemented	60			
Agriculture		Feeding of intensive livestock	Research	CH ₄	implemented				
Agriculture		Production of energy biomass	Economic	CO ₂	implemented				
Agriculture		Agricultural use of compost from sludges of sewage treatment plants and from municipal waste	Economic Information Regulatory	CH ₄ CO ₂ N ₂ O	implemented	1,300			
Agriculture		Action programmes in areas vulnerable to nitrate contamination	Information Regulatory	CO ₂ N ₂ O	implemented	Cluster value	Cluster value		
Agriculture		Codes of good agricultural practices	Education Voluntary/	CO ₂ N ₂ O	implemented	Cluster value	Cluster value		

<u>Sector</u>	<u>Projection Scenario</u>	<u>Name</u>	<u>Type</u>	<u>GHG</u>	<u>Status</u>	<u>Absolute Reduction [kt CO₂ eq. p.a.]</u>			<u>Costs [EUR/t]</u>
						<u>2005</u>	<u>2010</u>	<u>2020</u>	
			negotiated agreement						
Agriculture		Agro-environmental requirements by the Common Agricultural Policy	Economic Regulatory	CO ₂ N ₂ O	implemented	Cluster value	Cluster value		
Agriculture		Strategy for energy saving and efficiency in Spain 2004 - 2012 (E4): Plan of Action 2005 - 2007: agricultural sector	Economic Education Information	CO ₂	implemented	20			
Agriculture		Sinks in agriculture	Voluntary/ negotiated agreement	CO ₂	implemented		5,800		
Agriculture		Combined emission reduction of ES-AGR-17 ES-AGR-18 ES-AGR-19	Economic Education Information Regulatory Voluntary/ negotiated agreement	CO ₂ N ₂ O	implemented	1040	1690		
Forestry		Spanish Forestry Plan (PFE) (2003-2032)	Regulatory	CO ₂	implemented				
Forestry		Restoration of the plant cover and increase of the area covered by trees	Regulatory	CO ₂	implemented				
Forestry		Forest management and forest treatment	Regulatory	CO ₂	implemented				
Forestry		Fight against forest fires	Regulatory	CO ₂	implemented				
Forestry		Forest health	Information Regulatory	CO ₂	implemented				
Forestry		National Forest Inventory (IFN)	Information	CO ₂	implemented				
Forestry		National Soil Erosion Inventory (INES)	Information	CO ₂	implemented				
Forestry		National Forestry Map	Information	CO ₂	implemented				
Forestry		Biomass expansion factors	Research	CO ₂	implemented				
Forestry		Carbon fluxes	Research	CO ₂	implemented				
Waste		National Plan on Urban Waste	Economic Information Regulatory	CH ₄ CO ₂ N ₂ O	implemented				
Waste		National Prevention Programme	Economic	CH ₄	implemented				

<u>Sector</u>	Projection Scenario	Name	Type	GHG	Status	Absolute Reduction [kt CO ₂ eq. p.a.]			<u>Costs [EUR/t]</u>
						2005	<u>2010</u>	2020	
Waste		National programmes on recovery and recycling of packing waste and used packages	Information	CO ₂	implemented				
			Regulatory	N ₂ O					
Waste		National Compost Programme	Economic	CH ₄	implemented				
			Information	CO ₂					
Waste		National Energetic Utilisation Programme	Regulatory	N ₂ O	implemented				
			Economic	CH ₄					
Waste		National Disposal Programme	Information	CO ₂	implemented				
			Regulatory	N ₂ O					
Waste		National Plan on Special Wastes	Economic	HFC	implemented				
			Information						
			Regulatory						

Policies and measures in the “with additional measures” projection

<u>Sector</u>	Projection Scenario	Name	Type	GHG	Status	Absolute Reduction [kt CO ₂ eq. p.a.]			<u>Costs [EUR/t]</u>
						2005	<u>2010</u>	2020	
Waste		Integrated National Waste Plan (2007-2015)	Planning		planned				

Source: Öko Institut, (accessed 14/06/2007), ECCP Policies and Measures database, <http://www.oeko.de/service/pam/index.php>

7. EVALUATION OF PROJECTIONS

Table 6. Summary of projections by gas in 2010 (Mt CO₂-eq.)

	Base-year*	No measures	With measures
Carbon dioxide (excl. LUCF)	224.5	397.2	370.3
Methane	32.0	49.1	35.4
Nitrous oxide	26.5	33.7	25.7
HFCs	4.6	14.3	4.5
PFCs	0.8	0.7	0.3
SF ₆	0.1	0.2	0.2
Total (excl. LUCF)	288.4	495.1	436.3
% change relative to base year (excl. LUCF)		71.7%	51.3%

*base year for F-gases is 1995

Source: 4th NC

Table 7. Summary of projections (6 gas basket) by sector in 2010 (Mt CO₂-eq.)

	Base year	with measures	% change relative to 1990
Energy (total, excluding transport)	142.2	205.3	44%
Public Electricity Generation	78.2	109.2	40%
Commercial, Institutional and Residential Combustion Installations	18.8	30.4	62%
Industrial Combustion Installations	42.9	63.1	47%
Extraction and Distribution of fossil Fuels	2.3	2.6	12%
Transport (energy)	70.2	145.7	108%
Road transport	52.3	118.8	127%
Other transport modes	17.9	27.0	50%
Industrial processes	26.5	31.4	29%
Solvents and other Product use	0.4	3.4	702%
Waste	9.8	9.6	-2%
Agriculture	34.0	36.5	7%
Other Sources & Sinks	5.2	4.5	-14%
Total (excl. sinks)	288.4	436.3	52%

Source: 4th NC

Table 8. Summary of projections by sector and by gas in 2010 (Mt CO₂-eq.) compared to base-year emissions

	Carbon Dioxide			Methane			Nitrous Oxide			F-gases		
	Base year	With measures	With additional measures	Base year	With measures	With additional measures	Base year	With measures	With additional measures	Base year	With measures	With additional measures
Energy (exc transport)	136.1	198.9	--	3.3	3.2	--	2.8	3.1	--	0.0	0.0	--
Public Electricity Generation	77.2	108.5		0.0	0.1		0.9	0.6		0.0	0.0	
Commercial, Institutional and Residential Combustion Installations	17.3	29.1		0.8	0.5		0.7	0.9		0.0	0.0	
Industrial Combustion Installations	41.6	61.3		0.1	0.1		1.3	1.7		0.0	0.0	
Extraction and Distribution of fossil Fuels	0.0	0.0		2.3	2.6		0.0	0.0		0.0	0.0	
Transport (energy)	69.1	142.2		0.3	0.2		0.9	3.3		0.0	0.0	
Road transport	51.4	115.6		0.2	0.1		0.7	3.0		0.0	0.0	
Other transport modes	17.7	26.6		0.0	0.1		0.2	0.3		0.0	0.0	
Industrial processes	18.1	27.6		0.1	0.1		2.9	1.6		5.4	2.1	
Solvents and other Product use	0.0	0.0		0.0	0.0		0.4	0.5		0.1	2.9	
Waste	1.2	1.6		7.5	6.5		1.2	1.5		0.0	0.0	
Agriculture	0.0	0.0		19.2	23.5		14.9	13.0		0.0	0.0	
Other Sources & Sinks	0.0	0.0		1.7	1.8		3.5	2.6		0.0	0.0	
Total (excl. sinks)	224.5	370.3	--	32.0	35.4	--	26.5	25.7	--	5.5	5.0	--

Source: 4th NC

Figure 1. Share by sector of 2010 greenhouse gas emissions according to the "With existing measures" projections

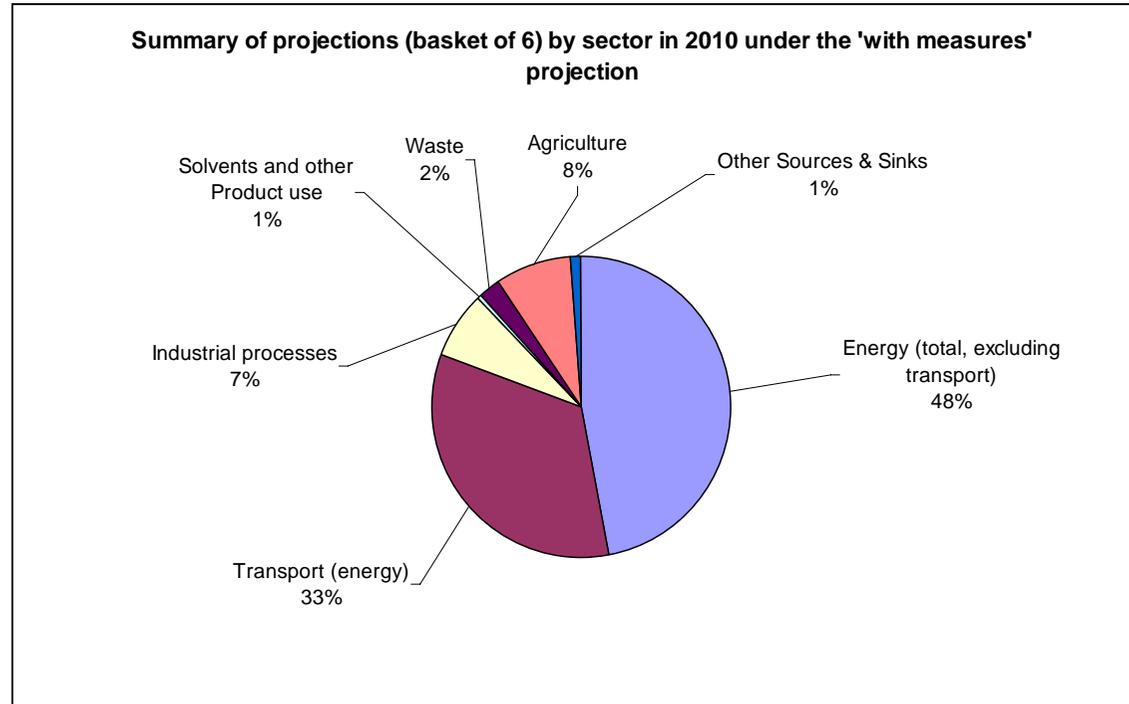


Table 9. Summary of projections (6 gas basket) in 2010, 2015 and 2020 (Mt CO₂-eq.)

	Base year*	2010	2010, % of base year level	2015	2015, % of base year level	2020	2020, % of base year level
Total (excluding LUCF)	286.2	436.3	152.5%	484.6	169.3%	528.9	184.8%

*base year for F-gases is 1995

Source: 4th NC

Table 10. Assessment of the target (6 gas basket), with a comparison of 2010 projections in 2005, 2006 and 2007 national reports

	Emissions in Mt CO ₂ -equiv., excluding LUCF			
	2010 projections from 2005	2010 projections from 2006	2010 projections from 2007	2010 projections from 2007, % of base year level
Base year emissions used for projections	286.0	288.4	288.4	100%
Kyoto Commitment/burden sharing	328.9	331.7	331.7	15.0%
With existing P&Ms projections	402.3	436.3	436.3	151.3%
Gap (-ve means overachievement of target)	73.4	104.6	104.6	36.3%
Remaining gap	73.4	104.6	104.6	36.3%
Effect of flexible mechanisms	20.0	20.0	31.8	11.0%
Effect of the ETS**			26.1	
Remaining gap (with use of flexible mechanisms)	53.4	84.6	46.7	16.2%

Above table excludes LUCF. LUCF will be covered in the main report, based on the questionnaire submissions

Source for 2005 data is 3rd NC, pp. 110-111; NIR 2005. Source for 2006 data is 4th NC. Source for 2007 data is the 4th NC and NAP 2.

* Base year data is not consistent with data reported in *The European Community's initial report under the Kyoto Protocol - Report to facilitate the calculation of the assigned amount of the European Community pursuant to Article 3, paragraphs 7 and 8 of the Kyoto Protocol (Submission to the UNFCCC Secretariat)*, EEA Technical report No 10/2006 (289.4 MtCO₂-eq MtCO₂-eq). This data is currently undergoing a review procedure by UNFCCC and is therefore subject to change.

** Projections do not include the 2nd NAP under the EU ETS. Spain estimates that operators will need to reduce their emissions or acquire emission rights in the order of 26.1 Mt CO₂ per year of the commitment period.

In table 11 a comparison is drawn concerning the projections for the trading sector between the 'with measure' variant of the 4th National Communications and the NAP 2. It is predicted that the GHG emissions in the NAP 2 will be 5% above the levels of the 'with measure' scenario of the 4th NC. In the NAP 2 projections for the energy sector, several sectors are aggregated which are not all included in the projections of the 4th NC. These discrepancies may result in higher emissions in the projections. However the emissions resulting from industrial processes are 14.8% above the level of the 'with measure' scenario.

Table 11. Comparison with projections for the trading sector (EU ETS)

	Included emissions	4 th NC (with measures)	NAP 2 projections	Difference
Energy sector	all GHG	178.3 ^a	184.16 ^b	--
Energy sector included in EU ETS	CO ₂	--	82.76	--
Industry sector	all GHG	31.4 ^c	36.06 ^c	--
Industry sector included in EU ETS	CO ₂	--	--	--
Total Energy & Industry	all GHG	209.7	220.22	5%

Energy use from industry is normally included in the energy sector for projections under the UNFCCC and included in the industry sector for NAP 2 projections. Due to these and other differences in the sector definitions projections for the individual sectors might not be comparable.

^a Included are emissions from the sectors public electricity generation, industrial combustion installations, extraction and distribution of fossil fuels, solvents and other product.

^b Included are emissions from the sectors the sectors energy industries (1.A.1), Manufacturing industries and construction (1.A.2), Other (1.A.5), Fugitive emissions from fuels (1.B), Solvent and other product use(3), Other (7)

^c Included are emissions from the sector industrial processes

8. DESCRIPTION OF MODELLING APPROACH

An integrated model calculating projections for pollutants under the Geneva Convention as well as emissions of greenhouse gases is used by Spain. Base year for the calculations is 2000 and emissions are projected until 2010 on a year by year basis. The model is based on work undertaken by the European Environment Agency and the US Environmental Protection Agency. Methods used for projecting emissions depend on the sources and sinks but overall boundary parameters have been introduced to ensure consistency between the different projections.

No information is provided in the 4th National Communication on sensitivity analysis' and uncertainty assessments undertaken.

9. PROJECTION INDICATOR REPORTING

Indicators for the projections were not reported in the 4th National Communication as well as in the submission to the Monitoring Mechanism in 2007.

10. REPORTING OF PARAMETERS ON PROJECTIONS

Parameters used for the projections were not reported in the 4th National Communication as well as in the submission to the Monitoring Mechanism in 2007.

Table 12. Indicators for projections to monitor and evaluate progress with policies and measures (2005/166/EC) Annex III

Indicators for projections were not reported in the 4th National Communication.

Table 13. List of parameters on projections (Annex IV of Implementing Provisions²)

Parameters used in the projections were not reported in the 4th National Communication

² Commission Decision of 10 February 2005 laying down rules implementing Decision No 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

11. COUNTRY CONCLUSIONS

The information available for Spain has increased significantly with the submission of its fourth National Communication under the UNFCCC. Many policies and measures have been quantified but the reduction effects are provided for specific years in some cases and periods of varying starting points and duration in other. These differences make comparisons between different policies and measures or with other Member States more difficult. Most measures addressing non-CO₂ greenhouse gases have not been quantified.

The 4th National Communication includes only few additional policies and measures, but it can be appreciated that many measures adopted since 2005 have been improved and re-enforced, as the additional information to Spain's communication under Decision 280/2004/EC shows. Nevertheless, Spain needs to take decisive steps immediately in order to reach its Kyoto target. For this purpose, Spanish Government foresees to adopt important and urgent additional measures in 2007. If these measures will not be taken Spain will not meet its Kyoto target.

Spain has provided a full set of projections for all years between 2000 and 2020 and all greenhouse gases for the first time for the 'no measures' and the 'with measures' scenarios. No projections for a 'with additional measures' scenario have been provided which is consistent with the very limited additional measures reported. No information on parameters and assumptions used for the projections and uncertainty assessments has been included in the national communication.

In the past, only projections for CO₂ from combustion were available. With the new data a much better picture is available of the expected development of emission in the next 15 years. While emissions from non-CO₂ gases in the with measures scenario for 2010 remain more or less at base year levels the release of carbon dioxide is expected to rise by around 65% in the same period. As CO₂ is responsible for around 80% of Spain's GHG emissions, Spain will need additional measures and a wide use of flexible mechanisms to meet its Kyoto target under the EC burden sharing agreement of +15%. The Spanish National Allocation Plan 2008-2012, approved by the Commission on 26 February 2007, determines that Spain will reduce its emissions to a +37% level, and will need to fill the gap between that +37% and the committed +15% by using flexible mechanisms (20%) and sinks (2%).

Compared to the projections included in the 3rd National Communication for CO₂ only a faster emission growth is predicted until 2010. The transport sector emissions show the biggest change, previously CO₂ emissions were projected to rise by 48% relative to base year, and now transport greenhouse gas emissions are predicted to rise by 108% relative to the base year. For energy generation, emissions increased by 40% relative to the base year in the latest 'with measures' projections compared to a 9% rise reported in the 3rd National Communication.

The intended use of Kyoto Mechanisms and the effect of the ETS reduce the gap of approximately 105 Mt CO₂ eq per year during the commitment period to 47 Mt CO₂ eq per year.