

Spain

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1. SUMMARY

The Spanish submission 2008 includes comprehensive information on policies and measures as well as projections. It provides three scenarios for several years. Hereby, a 'with additional measures' (WAM) scenario as well as sectoral sensitivity analyses with a high level of detail have been added in order to identify relevant emission sources and additional measures needed. However, it quantifies only total but no single effects of policies and measures (PAMs). The projection model is being improved to include their quantification individually.

With the PAMs included in the 'with existing measures' (WEM) scenario Spain will not be able to meet its burden sharing commitment by 2010. According to the adjusted projections the gap is about 31% of target emissions. This gap reduces to 23% in the WAM scenario. Spain has therefore started to make heavy use of credits from flexible mechanisms whose share are projected at 17.3% of target emissions. Eventually, in the best case scenario, i.e. WAM scenario plus credits from flexible mechanisms and effects of sinks, Spain would reach an emission level 3.9% above the 2010 target.

2. GHG PROJECTIONS AND PROGRESS TO KYOTO TARGETS

The Kyoto base-year is 1990 for CO₂, CH₄ and N₂O and 1995 for fluorinated gases.

The Spanish submission provides three scenarios, i.e. 'without measures' (WOM), 'with existing measures' (WEM) and 'with additional measures' (WAM), for the years 2005, 2010, 2015 and 2020. It gives detailed information on the modelling approach, i.e. Spain's Emissions Projections (SEP), and includes sensitivity analyses.

The corrected 2010 WEM projections show a greenhouse gas level of 437.3 Mt CO₂-eq. which reflects a gap of 31% compared to the EU burden sharing agreement under the Kyoto Protocol. Hence, the intended use of credits from flexible mechanisms has nearly doubled to 17.3% of target emissions. In the best case scenario, i.e. WAM projections, intensive use of flexible mechanisms plus effects of sinks Spain would reach an emission level still 3.9% above the target.

Sectoral projections go well into detail and provide sensitivity analysis for gases and differentiated effects of scenarios. According to the top-down calculation, the largest emission reduction is projected for the energy supply sector (36.2 Mt), whereas the other remaining energy sectors show rising emissions in the WEM scenario. Furthermore, agriculture, industrial processes and transport each contribute roughly a sixth to projected reductions for 2010. The WAM scenario projects the transport and energy supply sectors to deliver further nameable reductions.

The corrected 2020 WAM projections show an emission level stabilised at 418.1 Mt.

The former projections of 2006 and 2007 result in nearly the same amount of emissions for 2010 at 31% above the EU burden sharing agreement.

Table 1 shows, for all gases and main sectors:

- GHG emission projections for the two scenarios "with existing measures" (WEM) and "with additional measures" (WAM), as reported by Spain;
- Historic emissions (in the "reference year") as reported together with projections. For Spain, the reference year is 2005.

Table 2 shows, for all gases and main sectors:

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

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and comparability between projections and the latest (2008) GHG inventory data¹. In the case of Spain, the correction factor is very small (1.00054).

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

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

	Carbon dioxide			Methane			Nitrous oxide			F-gases (SF ₆ , HFCs and PFCs)			Total		
	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures
Energy (excl. transport)	150.7	229.2	221.5	3.4	2.9	2.9	1.0	1.8	1.8	0.0	0.0	0.0	155.0	233.9	226.2
Energy supply	79.1	105.9	100.7	2.5	2.1	2.1	0.3	0.7	0.7	NA	NA	NA	81.9	108.7	103.6
Energy – industry, construction	46.3	80.7	80.7	0.1	0.2	0.2	0.4	0.7	0.7	NA	NA	NA	46.7	81.7	81.7
Energy – other (commercial, residential, agriculture)	25.3	42.6	40.0	0.8	0.6	0.6	0.3	0.3	0.3	NA	NA	NA	26.4	43.5	40.9
Transport (energy)	56.5	108.7	93.1	0.2	0.1	0.1	0.8	2.4	2.0	NA	NA	NA	57.5	111.1	95.2
Industrial processes	19.3	30.1	30.1	0.1	0.1	0.1	2.9	1.6	1.6	5.6	4.9	4.8	27.9	36.7	36.6
Waste	1.0	0.1	0.1	5.7	11.8	9.7	1.1	1.3	1.3	0.0	0.0	0.0	7.8	13.2	11.2
Agriculture	0.0	0.0	0.0	18.4	20.6	18.8	21.6	23.1	22.9	0.0	0.0	0.0	40.0	43.7	41.7
Other	1.0	1.4	1.4	0.0	0.0	0.0	0.4	0.2	0.2	NA	NA	NA	1.4	1.6	1.6
Total (excl. LULUCF)	228.5	369.5	346.2	27.7	35.5	31.6	27.8	30.4	29.8	5.6	4.9	4.8	289.6	440.2	412.4

Source: Based on Spanish MM Submission (12/2007)

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Table 2. Summary of projections by sector and by gas in 2010 compared to 1990 emissions (Mt CO2-eq.)

	Carbon dioxide			Methane			Nitrous oxide			F-gases (SF6, HFCs and PFCs)			Total		
	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures
Energy (excl. transport)	150.7	227.6	220.0	3.4	2.9	2.9	1.0	1.8	1.8	0.0	0.0	0.0	155.0	232.4	224.7
Energy supply	79.1	105.2	100.1	2.5	2.1	2.1	0.3	0.7	0.7	0.0	NA	NA	81.9	108.0	102.9
Energy – industry, construction	46.3	80.2	80.2	0.1	0.2	0.2	0.4	0.7	0.7	0.0	NA	NA	46.7	81.1	81.1
Energy – other (commercial, residential, agriculture)	25.3	42.3	39.7	0.8	0.6	0.6	0.3	0.3	0.3	0.0	NA	NA	26.4	43.2	40.7
Transport (energy)	56.5	108.0	92.5	0.2	0.1	0.1	0.8	2.3	2.0	0.0	NA	NA	57.5	110.4	94.6
Industrial processes	20.0	29.9	29.9	0.1	0.1	0.1	2.9	1.5	1.5	3.4	4.9	4.8	26.3	36.4	36.3
Waste	0.3	0.1	0.1	5.7	11.7	9.7	1.1	1.3	1.3	0.0	0.0	0.0	7.1	13.2	11.1
Agriculture	0.0	0.0	0.0	18.7	20.4	18.7	21.7	22.9	22.7	0.0	0.0	0.0	40.3	43.4	41.4
Other	1.0	1.3	1.3	0.0	0.0	0.0	0.4	0.2	0.2	0.0	NA	NA	1.4	1.6	1.6
Total (excl. LULUCF)	228.5	367.0	343.9	28.0	35.3	31.4	27.8	30.2	29.6	3.4	4.9	4.8	287.7	437.3	409.7

Source: Based on Spanish MM Submission (12/2007)

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

	Carbon dioxide			Methane			Nitrous oxide			F-gases (SF6, HFCs and PFCs)			Total		
	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures	Reference year emissions	With existing measures	With additional measures
Energy (excl. transport)	100	151.1	146.0	100	86.1	85.8	100	182.0	181.6	100	0.0	0.0	100	149.9	144.9
Energy supply	100	133.0	126.5	100	83.9	83.8	100	255.1	259.3	100	NA	NA	100	131.9	125.6
Energy – industry, construction	100	173.3	173.3	100	332.9	332.9	100	180.3	180.3	100	NA	NA	100	173.6	173.6
Energy – other (commercial, residential, agriculture)	100	167.2	157.2	100	73.8	73.0	100	115.4	109.9	100	NA	NA	100	163.7	154.1
Transport (energy)	100	191.0	163.7	100	41.5	36.6	100	300.1	254.1	100	NA	NA	100	191.9	164.4
Industrial processes	100	149.6	149.6	100	99.7	99.7	100	53.5	53.5	100	145.3	142.7	100	138.4	138.1
Waste	100	45.7	45.7	100	206.1	170.0	100	117.7	118.8	100	0.0	0.0	100	185.5	156.8
Agriculture	100	0.0	0.0	100	109.6	100.2	100	105.8	104.8	100	0.0	0.0	100	107.6	102.6
Other	100	131.4	131.4		0.0	0.0		66.5	66.5		NA	NA		114.3	114.3
Total (excl. LULUCF)	100	160.6	150.5	100	125.8	112.1	100	108.5	106.4	100	145.3	142.7	100	152.0	142.4

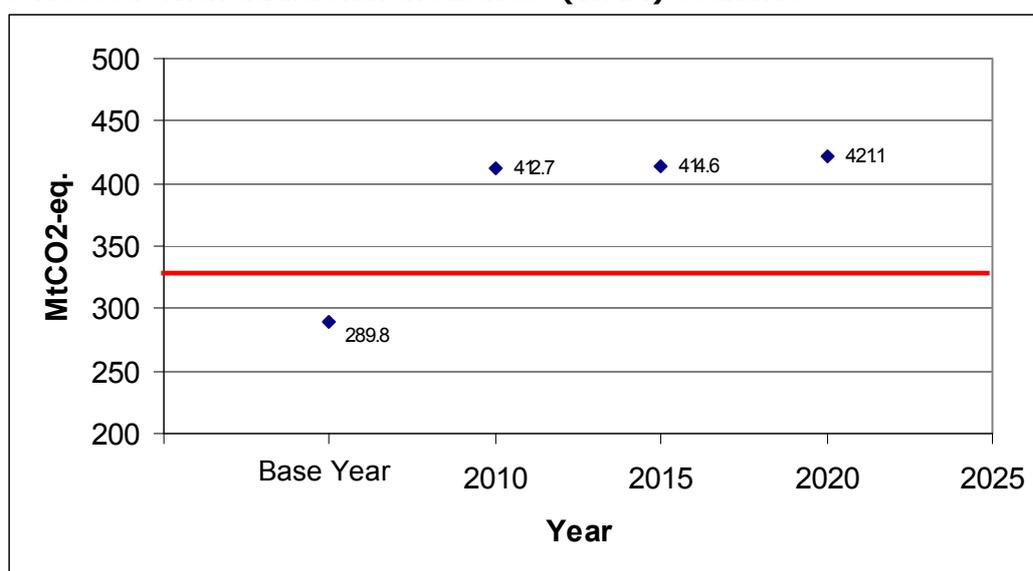
Based on Spanish MM Submission (12/2007)

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

	Unit	Base-year emissions under the Kyoto Protocol	2010 projections 'with existing measures'	2010 projections 'with additional measures'
Total GHG emissions (excluding LULUCF)	Mt CO ₂ -eq.	289.8	440.5	412.7
	Index (base-year emissions = 100)	100	152.0	142.4

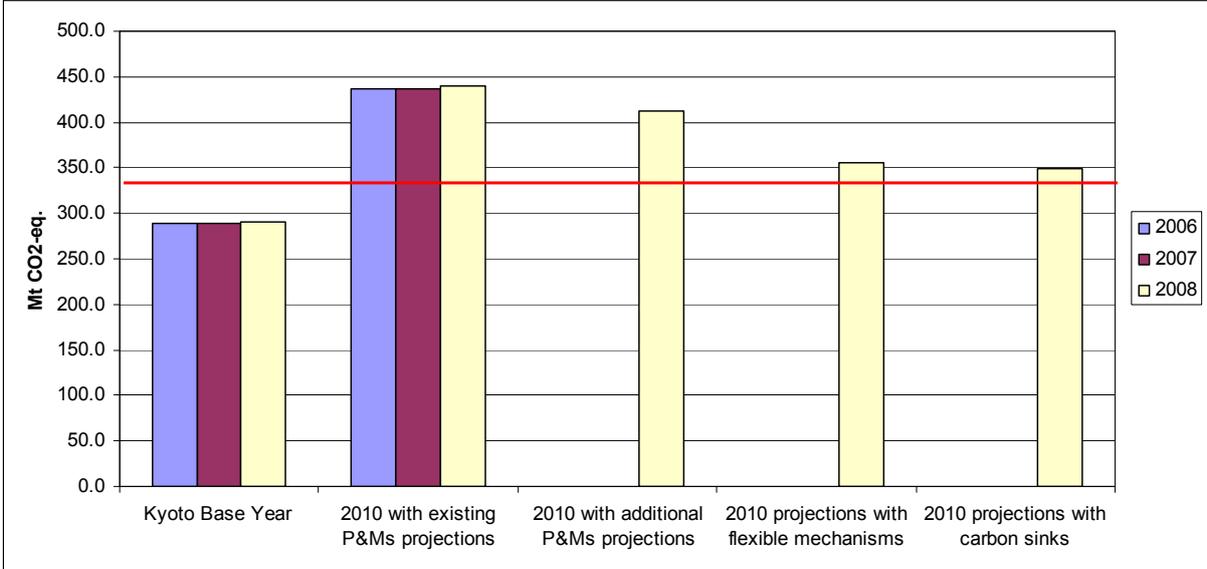
Source: Spain's MM submission, December 2007, and Annual greenhouse gas inventory 1990 – 2006, April 2008.

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

Figure 1. Greenhouse gas projections in 2010, 2015 and 2020 (Mt CO₂-eq.) – corrected 'with additional measures' (WAM) scenario

Source: Based on Spanish MM Submission (12/2007)

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



Source: For 2006 data: 4th NC; For 2007 data: 4th NC and NAP 2; For 2008 data: Spanish MM Submission (12/2007)

3. CLIMATE CHANGE MITIGATION POLICIES AND MEASURES

The comparison of existing measures between the top-down and bottom-up approaches can only be undertaken carefully, since not single, but only cross-sectoral PAMs have been quantified which, however, comprise a namable amount of emission reduction. Subject to this, hence, the projection total (61.2 Mt CO₂-eq.) is 15% higher than the quantified PAM total (53.1 Mt). Thereby, the largest emission reduction is projected to result from energy supply (36.2 Mt/ 59%). Other sectors are projected to contribute by far less, i.e. agriculture (13.1 Mt/ 21%), transport and industrial processes (each 9.4 Mt = 15%), whereas remaining energy subsectors (other and industry and construction) have negative effects (-4.8 Mt/ -8% and -4.6 Mt/ -8%), i.e. rising emissions even with existing measures.

The comparison of planned measures is not possible, since none of the planned PAMs have been quantified. However, the projected reduction of planned measures (27.8 Mt) mainly result from the transport (15.9 Mt/ 57%) and energy supply (5.1 Mt = 18%) sectors.

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

	Top down calculation		Bottom Up calculation	
	Existing Measures	Planned Measures	Existing Measures	Planned Measures
Energy (total, excluding transport)	26.8	7.7	NE	NE
Energy supply	36.2	5.1	NE	NO
Energy – industry, construction	-4.6	0.0		
Energy – other (commercial, residential, agriculture)	-4.8	2.6	NE	NE
Transport (energy)	9.4	15.9	NE	NE
Industrial processes	9.4	0.1	NE	NE
Waste	1.9	2.1	NE	NE
Agriculture	13.1	2.0	NE	NE
Cross-sectoral	0.5	0.0	53.1	NO
Total (excluding LULUCF)	61.2	27.8	53.1	NE

Note: The effects of measures detailed above are calculated firstly by determining the difference between total projections in each scenario and secondly by summing the reported effect of individual measures.

Source: Based on Spanish MM Submission (12/2007)

Table 6. Detailed information on Existing Policies and measures

Sector	Name	Type	GHG	Status	Absolute Reduction [kt CO ₂ -eq. p.a.]			Costs [EUR/t]
					2005	2010	2020	
Agriculture	Development of IPPC Directive: guide of BATs in the aviculture meat sector. (Ministry of Environment and Agriculture) 2006.	Information	CH ₄	implemented				
Agriculture	Development of IPPC Directive: guide of BATs in the aviculture egg sector. (Ministry of Environment and Agriculture) 2006.	Information	CH ₄	implemented				
Agriculture	Development of IPPC Directive: guide of BATs in the pork sector. (Ministry of Environment and Agriculture) 2006.	Information	CH ₄	implemented				
Agriculture	Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control (IPPC). (law 16/2002, 1 July, for the integrated prevention and control of contamination. (BOE n° 157 de 2 de julio de 2002.))	Regulatory	CH ₄	implemented				
Cross-cutting			CO ₂					
Energy consumption			N ₂ O					
Energy supply								
Industrial Processes								
Waste								
Agriculture	Strategy for energy saving and efficiency in Spain 2004-2012, Action plan 2005-2007 and Action plan 2008-2012.	Planning	CH ₄	implemented	2 696			
Cross-cutting			CO ₂					
Energy consumption			N ₂ O					
Energy supply								
Industrial Processes								
Transport								
Waste								
Energy consumption	Renewable Energies Plan 2005-2010. (Agreement of the Council of Ministers of 26 August 2005)	Planning	CH ₄	implemented		27 020		
Energy supply			CO ₂					

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Transport			N ₂ O				
Cross-cutting	National Allocation Plans for emission rights 2005-2007/2008-2012	Economic	CH ₄	implemented	1 860	26 100	
Energy supply		Regulatory	CO ₂				
Industrial Processes			N ₂ O				
Cross-cutting	National Strategic Plan for Rural Development (2007-2013). Ministry of Agriculture, Fishery and Alimentation. October 2006.	Planning	CH ₄	implemented			
			CO ₂				
			N ₂ O				
Agriculture	Agreement of the Council of Ministers of 2 September 2007 concerning the Spanish Strategy for Climate Change and Clean Energy. Horizon 2007-2012-2020.	Planning	CH ₄	implemented			
Cross-cutting			CO ₂				
Energy consumption			HFC				
Energy supply			N ₂ O				
Forestry			PFC				
Industrial Processes			SF ₆				
Transport							
Waste							
Energy consumption	Directive 2002/91/EC concerning energy efficiency of buildings	Regulatory	CH ₄	implemented			
			CO ₂				
			N ₂ O				
Energy consumption	RD 314/2006 concerning the approval of the Technical Building Code	Regulatory	CH ₄	implemented			
			CO ₂				
			HFC				

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			N ₂ O	
			PFC	
Energy consumption	RD 1218/2002 concerning the modification of RD 1751/1998 concerning the approval of the regulation of thermal installations in buildings and complementary technical instructions (ITE) and the creation of an Advisory Committee for thermal installations in buildings	Regulatory	CH ₄	implemented
			CO ₂	
			HFC	
			N ₂ O	
			PFC	
Energy consumption	RD 47/2007 concerning the basic process for energy efficiency certification of buildings of new construction	Regulatory	CH ₄	implemented
			CO ₂	
			HFC	
			N ₂ O	
			PFC	
Energy supply	Development of IPPC Directive: reference document to BATs for large combustion installations	Information	CO ₂	implemented
			N ₂ O	
Energy supply	Directive 2001/80/EC concerning the limitation of emissions from large combustion installations. (Real Decreto (RD) 430/2004)	Regulatory	CO ₂	implemented
			N ₂ O	
Energy supply	Directive 2004/8/EC concerning the promotion of cogeneration (RD 616/2007 concerning the promotion of cogeneration).	Regulatory	CH ₄	implemented
			CO ₂	
			N ₂ O	

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Energy supply	Directive 2001/77/EC concerning the promotion of electricity generation from renewable energy sources in the interior electricity market	Regulatory	CH ₄	implemented
			CO ₂	
			N ₂ O	
Energy supply	Report on planning in the electricity and gas sectors 2002-2011. Revision 2005-2011	Planning	CH ₄	implemented
			CO ₂	
			N ₂ O	
Energy supply	National Plan for Strategic Carbon Reserve 2006-2012 and New Model of Integrated and Sustainable Development of Mining Areas	Planning	CH ₄	implemented
			CO ₂	
			N ₂ O	
Energy supply	RD 1028/2007 concerning the establishment of the administrative procedure for the processing of applications for the authorisation of installations for electricity generation in the territorial sea	Regulatory	CH ₄	implemented
			CO ₂	
			N ₂ O	
Energy supply	National Reduction Plan for Emissions of Large-scale Combustion Installations (PNRE-GIC), established in RD 430/2004, in order to implement the Directive 2001/80/EC	Regulatory	CO ₂	implemented
			N ₂ O	
Industrial Processes	Development of IPPC Directive: reference document to best available technologies (BATs) in the petroleum refining sector	Information	CH ₄	implemented
			CO ₂	
			N ₂ O	
Industrial Processes	Development of IPPC Directive: reference document to BATs in iron and steel production	Information	CH ₄	implemented
			CO ₂	

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			N ₂ O	
Industrial Processes	Development of IPPC Directive: reference document to BATs in the non-ferrous metal industry	Information	CO ₂	implemented
			PFC	
Industrial Processes	Development of IPPC Directive: reference document to BATs in nitric acid production. European Fertilizer Manufacturers Association (EFMA). Year 2000	Information	N ₂ O	implemented
Industrial Processes	Development of IPPC Directive: reference document to BATs in ammonia production. European Fertilizer Manufacturers Association (EFMA). Year 2000	Information	N ₂ O	implemented
Industrial Processes	Development of IPPC Directive: reference document to BATs in ammonia nitrate and ammonia calcium nitrate production. European Fertilizer Manufacturers Association (EFMA). Year 2000	Information	N ₂ O	implemented
Industrial Processes	Development of IPPC Directive: reference document to BATs in the soda chlorine sector	Information	CH ₄	implemented
			CO ₂	
			N ₂ O	
Industrial Processes	Development of IPPC Directive: reference document to BATs in large-scale chemical production	Information	CH ₄	implemented
			CO ₂	
			N ₂ O	
Industrial Processes	Development of IPPC Directive: reference document to BATs in the pulp and paper industry	Information	CH ₄	implemented
			CO ₂	
			N ₂ O	
Industrial Processes	Development of IPPC Directive: reference document to BATs in the food, beverages and milk sectors	Information	CH ₄	implemented
			CO ₂	
			N ₂ O	

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Industrial Processes	Development of IPPC Directive: reference document to BATs in the cement and lime industry	Information	CH ₄ CO ₂ N ₂ O	implemented
Industrial Processes	Development of IPPC Directive: reference document to BATs in the textile sector	Information	CH ₄ CO ₂ N ₂ O	implemented
Industrial Processes	Development of IPPC Directive: reference document to BATs in glass production	Information	CH ₄ CO ₂ N ₂ O	implemented
Industrial Processes	Development of IPPC Directive: reference document to BATs in the ferrous metal industry	Information	CH ₄ CO ₂ N ₂ O	implemented
Industrial Processes	Development of IPPC Directive: technical guide for the manufacture of mineral wool	Information	CH ₄ CO ₂ N ₂ O	implemented
Industrial Processes	Development of IPPC Directive: technical guide for the manufacture of ceramic construction materials	Information	CH ₄ CO ₂ N ₂ O	implemented
Industrial Processes	Development of IPPC Directive: technical guide for copper metallurgy	Information	CH ₄ CO ₂ N ₂ O	implemented
Industrial Processes	Development of IPPC Directive: technical guide for lead metallurgy	Information	CH ₄ CO ₂	implemented

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			N ₂ O	
Industrial Processes	EC regulation n° 842/2006 concerning fluorinated greenhouse gases	Regulatory	HFC	implemented
			PFC SF ₆	
Industrial Processes	Directive 2004/42/EC on the limitation of COV emissions in the use of organic solvents for determinated paint and varnish and in the use of products for car renovation (RD 227/2006)	Regulatory	CO ₂	implemented
Industrial Processes	Directive 1999/13/EC relative to the limitation of COV emissions due to the use of organic solvents in determinated activities and installations (RD 117/2003)	Regulatory	CO ₂	implemented
Forestry	Spanish Forestry Plan (2002-2032)	Planning	CH ₄	implemented
			CO ₂ N ₂ O	
Transport	Directive 2003/30/EC concerning the promotion of the utilisation of biofuels and other renewable fuels in transportation. (RD 61/2006)	Regulatory	CH ₄	implemented
			CO ₂ N ₂ O	
Transport	Directives 70/220/EC concerning light vehicle emissions (last modification 98/69) and 88/77/EC concerning heavy vehicles (last modification 1999/96) (RD 2028/1986 y sus modificaciones)	Regulatory	CH ₄	implemented
			CO ₂ N ₂ O	
Transport	Directive 2006/40/EC concerning emissions from air conditioning systems in motor vehicles and the modification of Directive 70/156/EEC	Regulatory	HFC	implemented
			PFC	
Transport	White book of transportation: European transport policy vis-à-vis 2010: the hour of truth	Planning	CH ₄	implemented
			CO ₂	

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Transport	Strategic Infrastructure and Transport Plan (PEIT) 2005-2020	Planning	N ₂ O CH ₄	implemented	30 000
Transport	RD Law 13/2006 for the establishment of urgent measures concerning the program PREVER for the modernisation of the vehicle fleet	Economic	CO ₂ N ₂ O CH ₄	implemented	
Waste	RD 252/2006 for the revision of recycling and utilisation objectives established in law 11/1997	Regulatory	CO ₂ N ₂ O CH ₄	implemented	
Waste	RD 1481/2001 concerning the elimination of residual waste by storage on landfills	Regulatory	CO ₂ N ₂ O CH ₄	implemented	

Source: Öko-Institut, (accessed 30/06/2008), ECCP Policies and Measures database, <http://www.oeko.de/service/pam/index.php>

Table 7. Detailed information on Planned Policies and measures

Sector	Name	Type	GHG	Status	Absolute Reduction [kt CO ₂ -eq. p.a.]			Costs [EUR/t]
					2005	2010	2020	
Agriculture	Plan for Bio-digestion of Liquid Manures	Planning	CH ₄	planned				
Agriculture	Plan for the reduction of nitrogen fertiliser use	Planning	N ₂ O N ₂ O	planned				
Agriculture	Increase of conserving sowing	Planning	CH ₄ CO ₂	planned				

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			N ₂ O		
Agriculture	Improve energy efficiency in irrigation areas, as much in water supply of hydrological resources as in irrigation systems (gravity spray)	Planning	CH ₄	planned	
			CO ₂		
			N ₂ O		
Agriculture	Other actions for emission reduction of agricultural machinery	Planning	CH ₄	planned	
			CO ₂		
			N ₂ O		
Energy consumption	Registry of voluntary compromises of companies	Voluntary/ negotiated agreement	CH ₄	planned	
			CO ₂		
			N ₂ O		
Energy consumption	Courses of action in buildings (limitation of internal/external illumination hours. CCAA and local entities).	Planning	CH ₄	planned	
			CO ₂		
			N ₂ O		
Energy consumption	Improve energy efficiency in buildings across improvements in protective insulation and saving management	Planning	CH ₄	planned	
			CO ₂		
			N ₂ O		
Energy consumption	Control of internal temperature systems in commercial centres and offices (private) by avoiding losses through windows and doors.	Planning	CH ₄	planned	
			CO ₂		
			N ₂ O		
Energy consumption	Substitution of present illumination by low consumption electric bulbs in the private sector.	Planning	CH ₄	planned	
			CO ₂		

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			N ₂ O		
Energy consumption	Utilisation of thermal solar panels at a higher percentage than in the Action Plan of the E4 2008-2012 in existing public buildings.	Planning	CH ₄	planned	
			CO ₂		
			N ₂ O		
Industrial Processes	Voluntary agreement SF6	Voluntary/negotiated agreement	SF ₆	planned	
Industrial Processes	Voluntary agreement PFCs	Voluntary/negotiated agreement	PFC	planned	
Transport	Course of action in mobility: promotion of higher booking ratios	Planning	CH ₄	planned	
			CO ₂		
			N ₂ O		
Transport	Restriction on the road traffic of private vehicles in city centres (in effect in cities with high density of urban road traffic).	Planning	CH ₄	planned	
			CO ₂		
			N ₂ O		
Transport	Reduction of passenger car mobility	Planning	CH ₄	planned	
			CO ₂		
			N ₂ O		
Waste	National Integrated Plan for Residual Waste 2008-2012 (PNIR)	Planning	CH ₄	planned	
			CO ₂		
			N ₂ O		
Waste	Recuperation of biogas in landfills	Other	CH ₄	planned	

Source: Öko-Institut, (accessed 30/06/2008), ECCP Policies and Measures database, <http://www.oeko.de/service/pam/index.php>

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

Status	CCPM	Sector
National policies and measures already in force before CCPM was adopted	Support scheme for energy crops under CAP (795/2004)	Agriculture
Existing national policies and measures reinforced by CCPM	Promotion of electricity from RE sources 2001/77/EC	Energy supply
	Taxation of energy products 2003/96/EC	Energy supply
	Energy performance of buildings 2002/91/EC	Energy consumption
	Support under CAP - amendment (1783/2003)	Agriculture
	Support for rural development from EAGGF (1257/1999)	Agriculture
	Pre-accession measures for agriculture and rural development (1268/1999)	Agriculture
	Landfill directive 1999/31/EC	Waste
New national policies and measures implemented after CCPM was adopted	Kyoto Protocol project mechanisms 2004/101/EC	Cross-cutting
	Emissions trading 2003/87/EC	Cross-cutting
	Integrated pollution prevention and control 96/61/EC	Cross-cutting
	Promotion of cogeneration 2004/8/EC	Energy supply
	Internal electricity market 2003/54/EC	Energy supply
	Internal market in natural gas 98/30/EC	Energy supply
	Directives on energy labelling of appliances	Energy consumption
	End-use efficiency and energy services 2006/32/EC	Energy consumption
	Eco-management & audit scheme (EMAS) EC 761/2001	Energy consumption
	Efficiency of hot water boilers 92/42/EEC	Energy consumption
	Ecodesign requirements for energy-using products 2005/32/EC	Energy consumption
	Energy labelling for office equipment 2422/2001	Energy consumption
	Efficiency fluorescent lighting 2000/55/EC	Energy consumption
	Promotion of biofuels for transport 2003/30/EC	Transport
	Transport modal shift to rail 2001/12/EC etc.	Transport
	Consumer information on cars 1999/94/EC	Transport
	Support under CAP (1782/2003)	Agriculture
	Nitrates directive 91/676/EEC	Agriculture
	Rural development support and CAP(2603/1999, 1698/2005 and 1290/2005)	Agriculture
	Packaging and packaging waste (94/62/EC, 2004/12/EC, 2005/20/EC)	Waste
Directive on waste 2006/12/EC	Waste	
Status of national policy or measure not reported	Integrated European railway area (COM(2002)18 final)	Transport
	Agreement with car manufacturers ACEA etc.	Transport
	Marco Polo programme on freight transport	Transport
	Motor challenge, voluntary EC programme	Energy consumption
	HFCs in mobile air conditioning 2006/40/EC	Transport
	F-gas regulation (842/2006)	Industrial Processes

Source: MS responses to the CCPMs questionnaire, 2005 and personal communications 2008.

Spain has implemented PAMs mainly after the adoption of CCPM, particularly on energy consumption. However, a fifth of PAMs has been reinforced by CCPM, particularly in the agriculture sector, whereas only one measure existed before. Five PAMs related to transport have not been reported.

4. METADATA

Sources of information

- COMUNICACIÓN DE ESPAÑA A LA COMISIÓN EUROPEA RELATIVA A LAS PROYECCIONES DE GASES DE EFECTO INVERNADERO Y EFECTOS DE LAS POLÍTICAS Y MEDIDAS DE ACUERDO CON LA DECISION 280/2004/CE. Diciembre de 2007 [= Spain's submission under the monitoring mechanism, submitted December 2007]
- Spanish National Inventory Submission to the UNFCCC, 27 May 2008

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

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

Kyoto base-year emissions

Kyoto base-year emissions are presented throughout, except Table 1 which presents projections reference year emissions (see below). Kyoto base year emissions of greenhouse gases were calculated using 1990 emissions for carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O) and 1995 emissions for fluorinated gases (SF₆, HFCs and PFCs). Kyoto base-year emissions have now been reviewed and set for all EEA countries, except Croatia.

Projections reference year emissions

Projections reference year emissions are presented in Table 1.

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

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

Quality of Reporting

Member State reporting in the sources detailed above was assessed semi-qualitatively. Scoring was attributed according to the level of detail and clarity: from 0 (representing not reported) to +++ (representing very detailed and/or clear reporting). Guidance used for this assessment included the reporting requirements laid down in:

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

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

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

Category of Information	Example of good practice
Projection scenarios	"With existing measures" and "with additional measures" projections required, "without measures projection" optional.

Policies included in each projection	Clear presentation of the policies included in each projections scenario.
Expressed relative to historic reference year data	Projections are presented alongside consistent historic emissions.
Starting year	Starting year and emissions used as basis for for projections is detailed.
Split of projections	Projection split by all 6 gases (or F-gases together), all sectors and years
Presentation of results	Clear, both tables and graphs provided and/or used excel reporting template.
Description of methodologies	Description of approach, model and assumptions
Sensitivity analysis	Was an analysis carried out to determine the sensitivity of projections to variance in the input parameters? Are high medium and low scenarios presented?
Discussion of uncertainty	Is an uncertainty range for the projections provided?
Details of parameters and assumptions	Are parameters as required under Monitoring Mechanism 280/2004/EC reported?
Indicators for projections	Are indicators for projections as required under Monitoring Mechanism 280/2004/EC reported?

Table 9. Information provided on policies and Kyoto flexible mechanisms

Information provided	Level of information provided	Comments
Policy names	++	Policies are distinguished partly by long names.
Objectives of policies	+++	Detailed description.
Types of policies	+++	
Which greenhouse gases?	+++	
Status of Implementation	+++	
Implementation body	+++	
Quantitative assessment of emission reduction effect and cost of policies	+	Total effect provided, also for WOM projection. However, single PAMs have not been quantified.
Interaction with other national and EU level policies	+	Partly adressed
Measures implementing community legislation	++	CCPM reference not always given
Arrangements for flexible mechanisms	++	
Balance between domestic action and flexible mechanisms	+	

Table 10. Information provided on projections

Category of Information	Level of information provided	Comments
Projection scenarios	+++	All three scenarios (WEM, WAM, WOM) delivered
Policies included in each projection	+++	Clearly presented, but not quantified
Expressed relative to historic reference year data	+++	
Starting year	++	

Split of projections	+++	Thorough projection split by gases, sectors and years
Presentation of results	+++	Clear reporting, excel template provided
Description of methodologies	+++	Detailed description
Sensitivity analysis	+++	Variance of input parameters
Discussion of uncertainty	0	
Details of parameters and assumptions	++	Main assumptions stated.
Indicators for projections	++	Most indicators reported

Table 11. Parameters for Projections

1. Mandatory parameters on projections	2005	2010	2015	2020	Units
Assumptions for general economic parameters					
GDP (value at given years or annual growth rate and base year)	739	889	1031	1161	Value (Euro 2000 basis)
Population (value at given years or annual growth rate and base year)		0.04	0.06	0.07	% of 2005 value
International coal prices at given years in euro per tonne or GJ (Gigajoule)	49.1	50	51	51	€ per tonne or GJ (Gigajoule)
International oil prices at given years in euro per barrel or GJ	43.9	55	58	61.5	€ per barrel or GJ
International gas prices at given years in euro per m3 or GJ	6.4	8.02	8.46	8.97	€ per m3 or GJ
Assumptions for the energy sector					
Total gross inland consumption (PJ) (split by oil, gas, coal, renewables, nuclear, other)					
6a. - Oil (fossil)	2984	3067	3158	3214	Petajoule (PJ)
6b. - Gas (fossil)	1252	1617	1932	2087	Petajoule (PJ)
6c. - coal	858	635	573	557	Petajoule (PJ)
6d. - Renewables	357	779	1086	1338	Petajoule (PJ)
6e. - Nuclear (IEA definition for energy calc.)	628	633	622	606	Petajoule (PJ)
6f. Net Electricity import (-+)	-4.84	-0.81	0	0	Petajoule (PJ)
6g. - Other Please Specify in Column I	7.89				Petajoule (PJ)
Total electricity production by fuel type (oil, gas, coal, renewables, nuclear, other)					
7. - Oil (fossil)	23211	12980	13625	11919	Gwhe
8. - Gas (fossil)	79280	105239	123801	135184	Gwhe
9. - coal	81458	54285	51033	49482	Gwhe
10. - Renewable	52756	102259	124002	152923	Gwhe
11. Nuclear (IEA definition for energy calc.)	57539	58865	57070	55586	Gwhe

Spain

12. - Other Please Specify in Column I	5380				Gwhe
Energy demand by sector split by fuel (delivered)					
13. Energy Industries	1532	1327	1315	1336	
13a. Oil (fossil)	355	290	284	283	Petajoule (PJ)
13b. Gas (fossil)	388	508	602	626	Petajoule (PJ)
13c. coal	789	529	429	426	Petajoule (PJ)
13d. Renewables					Petajoule (PJ)
13e. -- Nuclear (IEA definition for energy calc.)					Petajoule (PJ)
13e. - Other Please Specify in Column I					Gwhe
14. Industry	1064	1161	1271	1309	
14a. Oil (fossil)	332	266	290	299	Petajoule (PJ)
14b. Gas (fossil)	697	873	960	989	Petajoule (PJ)
14c. coal	35.7	22.2	21.1	21.4	Petajoule (PJ)
14d. Renewables					Petajoule (PJ)
14e. - Other Please Specify in Column I					Gwhe
15. Commercial (Tertiary)	146	180	205	234	
15a. Oil (fossil)	84.4	99	108	118	Petajoule (PJ)
15b. Gas (fossil)	60	78.9	94.2	113	Petajoule (PJ)
15c. coal	1.54	1.8	1.99	2.18	Petajoule (PJ)
15d. Renewables					Petajoule (PJ)
15e. - Other Please Specify in Column I					Gwhe
16. Residential	307	336	366	400	
16a. Oil (fossil)	169	153	148	140	Petajoule (PJ)
16b. Gas (fossil)	133	179	217	259	Petajoule (PJ)
16c. coal	4.78	4.33	1	0.94	Petajoule (PJ)
16d. Renewables					Petajoule (PJ)
16e. - Other Please Specify in Column I					Gwhe
17. Transport	1420	1451	1511	1553	
17a. Oil (fossil)	1420	1451	1511	1553	Petajoule (PJ)
17b. Gas (fossil)					Petajoule (PJ)

Spain

17d. Renewables					
17e. - Other Please Specify in Column I					Petajoule (PJ)
	11	81.3	146	160	Petajoule (PJ)
Assumptions on weather parameters, especially heating or cooling degree days					
Assumptions for the industry sector					
<i>For Member States using macroeconomic models:</i>					
The share of the industrial sector in GDP and growth rate					
<i>For Member States using other models:</i>					
The production index for industrial sector					
Assumptions for the transport sector					
<i>For Member States using macroeconomic models:</i>					
The growth of transport relative to GDP					Gg fuel consumed/GDP
<i>For Member States using other models:</i>					
The growth of passenger person kilometres	625378	689056	781339	845466	Million passenger km
The growth of freight tonne kilometres	420319	637214	715369	764611	Mtkm
Assumptions for buildings (in residential and commercial or tertiary sector)					
<i>For Member States using macroeconomic models:</i>					
The level of private consumption (excluding private transport)					
The share of the tertiary sector in GDP and the growth rate					
<i>For Member States using other models:</i>					
The rate of change of floor space for tertiary buildings and dwellings					
The number of dwellings and number of employees in the tertiary sector					
Assumptions in the agriculture sector					
<i>For Member States using macroeconomic models:</i>					
The share of the agriculture sector in GDP and relative growth					
<i>For Member States using other models:</i>					
Livestock numbers by animal type (for enteric fermentation beef, cows, sheep, for manure management pigs and poultry)					
33. Total Cattle					
33a. Dairy cattle	1028	942	908	950	1000 heads
33b. Non-dairy cattle	5398	5299	5199	5100	1000 heads
34. sheep	22749	22111	21491	20887	1000 heads
35. swine	25244	26532	27270	28028	1000 heads
36. poultry	181113	197809	214505	231202	1000 heads
37. Other, please specify					1000 heads
Goats	2905	2823	2744	2667	1000 heads
Horses	238	276	445	567	1000 heads
Other (mules, asses, etc.)	82.4	82.4	82.4	82.4	1000 heads
The area of crops by crop type					
Orange tree	123704	123704	123704	123704	Hectares

Spain

Tangerine tree	99992	99992	99992	99992	Hectares
Almond tree	596873	596873	596873	596873	Hectares
Olive tree	2E+06	2E+06	2E+06	2E+06	Hectares
Vineyard	1E+06	1E+06	1E+06	1E+06	Hectares
Barley	3E+06	3E+06	3E+06	3E+06	Hectares
Wheat	2E+06	2E+06	2E+06	2E+06	Hectares
Corn	476118	463422	450725	438029	Hectares
Oats	496327	483092	469856	456621	Hectares
Sunflower	786832	765850	744868	723885	Hectares
Cotton	94657	92133	89609	87084	Hectares
Tomatoe	62973	62973	62973	62973	Hectares
Grassland	1E+06	1E+06	1E+06	1E+06	Hectares
Rice	118211	119984	119984	119984	Hectares
Fallows	2E+07	2E+07	2E+07	2E+07	Hectares
Others	2E+06	2E+06	2E+06	2E+06	Hectares
TOTAL CROPS	4E+07	4E+07	4E+07	4E+07	Hectares
Emissions factors by type of livestock for enteric fermentation and manure management (t)					
40. enteric fermentation Dairy cattle					Tonnes CO2e /Thousand Heads
	1984	1984	1984	1984	
41. enteric fermentation Non-dairy cattle					Tonnes CO2e /Thousand Heads
	1142	1142	1142	1142	
42. enteric fermentation sheep					Tonnes CO2e /Thousand Heads
	180	168	168	168	
43. manure management Dairy cattle					Tonnes CO2e /Thousand Heads
	307	321	342	363	
44. manure management Non-dairy cattle					Tonnes CO2e /Thousand Heads
	24.2	24.2	24.2	24.2	
45. manure management sheep					Tonnes CO2e /Thousand Heads Consistent Units
	4.62	4.62	4.62	4.62	

Spain

46. manure management Swine	315	252	252	252	Tonnes CO2e /Thousand Heads
47. manure management Poultry	1.94	1.56	1.55	1.54	Tonnes CO2e /Thousand Heads
Assumptions in the waste sector					
Waste generation per head of population or tonnes of municipal solid waste	21526	22322	22727	22957	kt municipal
The organic fractions of municipal solid waste	44	0.44	0.44	0.44	%
Municipal solid waste disposed to landfills	66	0.4	0.36	0.35	%
52. Municipal solid waste disposed incinerated	8	0.16	0.18	0.19	%
53. Municipal solid waste disposed composted	13	0.21	0.23	0.23	%
54. Municipal solid waste disposed to landfills	14207	8990	8089	7956	kt
Assumptions in the forestry sector					
Forest definitions	Forest is a minimum area of land of 0.05-1.0 hectares with tree crown cover (or equivalent stocking level) of more than 10 per cent with trees with the potential to reach a minimum height of 2-5 metres at maturity in situ (it is assumed the definition inc				
Areas of:					
managed forests	532447	553126	573806	Hectares	
unmanaged forests	1E+07	1E+07	1E+07	Hectares	

2. Recommended parameters on projections	2005	2010	2015	2020	Units
Assumptions for general economic parameters					
GDP growth rates split by industrial sectors in relation to 2000	739	889	1031.4	1160.8	Value (Euro 2000 basis)
Comparison projected data with official forecasts					
Assumptions for the energy sector					
National coal, oil and gas energy prices per sector (including taxes)					
National electricity prices per sector as above (may be model output)					
Total production of district heating by fuel type	0	0	0	0	
Assumptions for the industry sector					
Assumptions fluorinated gases:					
Aluminium production and emissions factors		424	444	465	kt
Magnesium production and emissions factors					
Foam production and emissions factors		87199.34	39253.94	25924.81	kg
Stock of refrigerant and leakage rates					
<i>For Member States using macroeconomic models:</i>					
Share of GDP for different sectors and growth rates					
Rate of improvement of energy intensity (1990 = 100)					

Spain

<i>For Member States using other models:</i>					
Index of production for different sectors					
Rate of improvement or index of energy efficiency					
Assumptions for buildings (in residential and commercial / tertiary sector)					
<i>For Member States using macroeconomic models:</i>					
Share of tertiary and household sectors in GDP					
Rate of improvement of energy intensity					
<i>For Member States using other models:</i>					
Number of households					
Number of new buildings					
Rate of improvement of energy efficiency (1990 = 100)					
Assumptions for the transport sector					
<i>For Member States using econometric models:</i>					
Growth of transport relative to GDP split by passenger and freight					
Improvements in energy efficiency split by vehicle type					
Improvements in energy efficiency split by vehicle type, whole fleet/new cars					
Passenger cars (gasoline)		6.461861	6.532774	6.610327	ktep/100km
Passenger cars (diesel)		6.080274	6.039538	6.005543	ktep/100km
Passenger cars (LPG)		6.63807	6.63807	6.63807	ktep/100km
Light Duty Vehicles (gasoline)		9.829054	10.04607	10.11967	ktep/100km
Light Duty Vehicles (diesel)		9.181786	9.144244	9.139036	ktep/100km
Heavy Duty Trucks (Diesel)		17.16532	16.94353	16.89318	ktep/100km
Buses (Diesel)		27.60158	27.11553	27.04208	ktep/100km
Mopeds and motorcycles <50cm3		1.220273	1.123709	1.1237	ktep/100km
Motorcycles >50cm3		3.50707	3.30974	3.183801	ktep/100km
Rate of change of modal split (passenger and freight)					
Passenger (Road)		0.923199	0.913199	0.888199	%
Passenger (Rail)		0.043667	0.058667	0.088667	%
Passenger (Aviation)		0.030344	0.025344	0.020344	%
Passenger (Navigation)		0.00279	0.00279	0.00279	%
Freight (Road)		0.885708	0.864317	0.834008	%
Freight (Rail)		0.030513	0.047322	0.072816	%
Freight (Aviation)		0.000248	0.000249	0.000251	%
Freight (Navigation)		0.083531	0.088112	0.092926	%
Growth of passenger road kilometres		636135.5	713517.7	750942.5	Mpas·km
Growth of passenger rail kilometres		30089.08	45838.89	74965.08	Mpas·km
Growth of passenger aviation kilometres		20908.52	19802.04	17199.95	Mpas·km
— The growth of passenger navigation kilometres		1922.513	2179.989	2358.91	Mpas·km
Growth of freight tonne kilometres on road		615993.1	678235.1	703215	Mpas·km
Growth of freight tonne kilometres by rail		21221.05	37133.71	61396.45	Mpas·km
— The growth of freight tonne kilometres by plane		172.6312	195.7511	211.8173	Mpas·km
Growth of freight tonne kilometres by navigation		58093.99	69141.98	78352.6	Mpas·km
Assumptions for the agriculture sector					
<i>For Member States using econometric models:</i>					
Agricultural trade (import/export)					
Domestic consumption (e.g. milk/beef consumption)					
<i>For Member States using other models:</i>					

Spain

Development of area of crops, grassland, arable, set-aside, conversion to forests etc					
Permanent crops	4666175	4666175	4666175	Hectares	
Arable crops	7972050	7753637	7535225	Hectares	
Rice	119984	119984	119984	Hectares	
Grassland	1008276	1008276	1008276	Hectares	
Fallows	24111091	24285821	24460551	Hectares	
Macroeconomic assumptions behind projections of agricultural activity					
Description of livestock (e.g. by nutrient balance, output/animal production, milk production)					
Development of farming types (e.g. intensive conventional, organic farming)					
Distribution of housing/grazing systems and housing/grazing period					
Dairy cattle					
Liquid (slurry) systems	15	15	15	%	
Solid systems	60	60	60	%	
Daily application	25	25	25	%	
Grazing	0	0	0	%	
Non-dairy cattle					
Liquid (slurry) systems	0	0	0	%	
Solid systems	31.26247	31.26247	31.26247	%	
Daily application	0	0	0	%	
Grazing	68.73753	68.73753	68.73753	%	
Fattening pigs					
Liquid (slurry) systems	91.05852	91.05852	91.05852	%	
Solid systems	0	0	0	%	
Daily application	0	0	0	%	
Grazing	8.941481	8.941481	8.941481	%	
Sows					
Liquid (slurry) systems	95.3814	95.3814	95.3814	%	
Solid systems	0	0	0	%	
Daily application	0	0	0	%	
Grazing	4.618603	4.618603	4.618603	%	
Sheeps					
Liquid (slurry) systems	0	0	0	%	
Solid systems	16.80328	16.80328	16.80328	%	
Daily application	0	0	0	%	
Grazing	83.19672	83.19672	83.19672	%	
Horses					
Liquid (slurry) systems	7.5	7.5	7.5	%	
Solid systems	30	30	30	%	
Daily application	12.5	12.5	12.5	%	
Grazing	50	50	50	%	
Lying hens					
Liquid (slurry) systems	0	0	0	%	
Solid systems	100	100	100	%	
Daily application	0	0	0	%	
Grazing	0	0	0	%	
Other poultry					
Liquid (slurry) systems	0	0	0	%	
Solid systems	100	100	100	%	
Daily application	0	0	0	%	
Grazing	0	0	0	%	
Goats					

Spain

Liquid (slurry) systems		0	0	0	%
Solid systems		0	0	0	%
Daily application		0	0	0	%
Grazing		100	100	100	%
Other animals (mules, asses, etc)					
Liquid (slurry) systems		7.5	7.5	7.5	%
Solid systems		30	30	30	%
Daily application		12.5	12.5	12.5	%
Grazing		50	50	50	%
Parameters of fertiliser regime:					
Details of fertiliser use (type of fertiliser, timing of application, inorganic/organic ratio)					
Urea		209.8689	216.8087	223.7486	kt N
Other N fertilisers		728.0985	752.1749	776.2514	kt N
Manure		393.3322	412.4174	433.9922	kt N
Volatilisation rate of ammonia, following spreading of manure on the soil					
Dairy cattle		0.242857	0.242857	0.242857	(kg NH3/kg N)
Non-dairy cattle		0.242857	0.242857	0.242857	(kg NH3/kg N)
Fattening pigs		0.242857	0.242857	0.242857	(kg NH3/kg N)
Sows		0.242857	0.242857	0.242857	(kg NH3/kg N)
Sheeps		0.121429	0.121429	0.121429	(kg NH3/kg N)
Horses		0.121429	0.121429	0.121429	(kg NH3/kg N)
Lying hens		0.121429	0.121429	0.121429	(kg NH3/kg N)
Other poultry		0.242857	0.242857	0.242857	(kg NH3/kg N)
Goats		0.121429	0.121429	0.121429	(kg NH3/kg N)
Other animals (mules, asses, etc)		0.121429	0.121429	0.121429	(kg NH3/kg N)
Efficiency of manure use					
Parameters of manure management system:					
Distribution of storage facilities (e.g. with or without cover):		56.38	48.06	47.58	% Natural cover (old installations)
Nitrogen excretion rate of manures					
Dairy cattle		84.20766	92.60383	101	(kg N/head and year)
Non-dairy cattle		52.9843	52.9843	52.9843	(kg N/head and year)
Fattening pigs		6.326717	6.326717	6.326717	(kg N/head and year)
Sows		16.01955	16.01955	16.01955	(kg N/head and year)
Sheeps		5.065385	5.065385	5.065385	(kg N/head and year)
Horses		40	40	40	(kg N/head and year)
Lying hens		0.74385	0.74385	0.74385	(kg N/head and year)
Other poultry		0.5605	0.5605	0.5605	(kg N/head and year)
Goats		11.16577	11.16577	11.16577	(kg N/head and year)
Other animals (mules, asses, etc)		40	40	40	(kg N/head and year)
Methods of application of manure		100	100	100	% pig manure
Extent of introduction of control measures (storage systems, manure application), use of best available techniques					
pig feeding					

Spain

fattening		75.3	86.14	91.29	% phases & low nitrogen feeding
sows		46.43	56.57	63.29	% phases & low nitrogen feeding
Parameters related to nitrous oxide emissions from agricultural soils					
EF for direct emission from soils		0.018857	0.018857	0.018857	kg N ₂ O/kg N
N leaching factor		0.3	0.3	0.3	
EF for atmospheric deposition		0.015714	0.015714	0.015714	kg N ₂ O-N/kg N
EF for N leaching factor for direct emissions, Nitrogen content in crop residues)		0.039286	0.039286	0.039286	kg N ₂ O-N/kg N
Amount of manure treatment					