Germany

Contents

Figures and tables

1. SUMMARY

This country profile is mainly based on the submission 2007.

Germany provides extensive information on policies and measures and good information on projections in its 4th National Communication as well as in Policy Scenarios IV. The information contained in these documents is clear.

The projections are based on a submission under the monitoring mechanism in 2007. They give a detailed breakdown by sector and gas and the different scenarios use consistent assumptions.
In the presented 'with existing measures' (WEM) scenario, Germany will slightly underbid its target under the burden sharing agreement (-21%) by about 1.9%. In the 'with additional measures' (WAM) variant Germany will overshoot the required reduction by about 6.1%.

2. GHG PROJECTIONS AND PROGRESS TO KYOTO TARGETS

The Kyoto base-year is 1990 for CO_2, CH_4 and N_2O and 1995 for fluorinated gases.

For the scenario development, an energy system model is deployed, with the help of which the results of detailed – and in part, model-based – sectoral analyses are consolidated to a consistent and comprehensive data set for the energy-economic development. Specific analyses are undertaken for the sectors of space heating and warm water, electrical devices, transport and electricity production from renewable energies as well as from fossil fuels. For the remaining source sectors, the results of other analyses were adopted or incorporated. The projected scenarios are WEM, WAM and 'without measures' (WOM) for the years 2005, 2010, 2015 and 2020.

In the WEM scenario, the projected 2010 total GHG emissions will be 1.9% below the Kyoto target under the EU burden sharing agreement (-21%). In the WAM scenario for 2010, emissions are projected to be about 6.1% below the target which equals 26% below the base year level. Germany does not plan to make use of flexible mechanisms within the non EU-ETS sector in the first commitment period under the Kyoto Protocol. However, further emission reduction of 4.5 Mt CO2-eq. has been reported as effect of sinks.

The WAM projections for 2020 show a further decrease of the emission level towards 736.5 Mt.

Compared to the 2006 projection the 2007 projection estimated 45.5 Mt, or 4.5% less in the WEM scenario for 2010 and 71.2 Mt, or 7.2% less in the respective WAM scenario.

The Integrated Energy and Climate Programme ("Meseberg-Programm") of the German Cabinet of 23/24 August 2007 states further ambitious targets in different sectors. The envisaged total emission reduction amounts to 219.4 Mt CO2-eq. or about 36.6% compared to 1990.

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 Germany;
- Historic emissions (in the "reference year") as reported together with projections. For Germany, the reference year is 1990 for CO_2, N_2O and CH_4; for F-gases the reference year is 1995.

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 and comparability between projections and the latest (2008) GHG inventory data[1]. In the case of Germany, the correction factor is very small (0.99978).

[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).

Table 1. Summary of reported projections by sector and by gas in 2010 (Mt CO_2–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)	785.7	601.0	578.5	30.5	15.8	15.6	7.2	5.2	5.0	0.0	0.0	0.0	823.4	621.9	599.1
Energy supply	415.1	335.0	319.3	27.4	14.9	14.6	4.6	3.6	3.5	NA	NA	NA	447.1	353.5	337.5
Energy – industry, construction	154.5	91.2	90.7	0.2	0.1	0.1	1.6	0.9	0.9	NA	NA	NA	156.3	92.2	91.7
Energy – other (commercial, residential, agriculture)	216.1	174.8	168.5	2.8	0.8	0.8	1.1	0.7	0.7	NA	NA	NA	220.0	176.3	169.9
Transport (energy)	162.5	155.9	141.1	1.3	0.2	0.2	0.7	1.3	1.2	NA	NA	NA	164.4	157.4	142.4
Industrial processes*	84.2	73.8	73.5	0.0	0.0	0.0	23.8	15.1	15.1	15.5	16.1	13.2	123.5	104.9	101.7
Waste	0.0	0.0	0.0	38.2	7.6	7.6	2.2	2.7	2.7	0.0	0.0	0.0	40.4	10.3	10.3
Agriculture	0.0	0.0	0.0	29.3	22.5	22.5	48.4	37.2	37.2	0.0	0.0	0.0	77.7	59.7	59.7
Other	0.0	0.0	0.0	0.0	0.0	0.0	2.1	1.2	1.2	NA	NA	NA	2.1	1.2	1.2
Total (excl. LULUCF)	1032.3	830.7	793.1	99.3	46.0	45.9	84.4	62.6	62.3	15.5	16.1	13.2	1231.5	955.4	914.5

Source: Based on German Submission 09/2007

Table 2. Summary of projections by sector and by gas in 2010 compared to 1990 emissions (Mt CO_2-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)	785.6	599.1	576.7	30.5	15.7	15.5	7.2	5.2	5.0	0.0	0.0	0.0	823.3	620.0	597.3
Energy supply	414.9	333.9	318.3	27.4	14.8	14.6	4.6	3.6	3.5	0.0	NA	NA	446.9	352.4	336.4
Energy – industry, construction	154.5	90.9	90.5	0.2	0.1	0.1	1.6	0.9	0.9	0.0	NA	NA	156.3	91.9	91.4
Energy – other (commercial, residential, agriculture)	216.1	174.3	167.9	2.8	0.8	0.8	1.1	0.7	0.6	0.0	NA	NA	220.0	175.7	169.4
Transport (energy)	162.5	155.4	140.6	1.3	0.2	0.2	0.7	1.3	1.2	0.0	NA	NA	164.4	156.9	142.0
Industrial processes	84.2	73.5	73.3	0.0	0.0	0.0	23.8	15.0	15.0	11.9	16.0	13.1	119.8	104.6	101.4
Waste	0.0	0.0	0.0	38.2	7.6	7.6	2.2	2.7	2.7	0.0	0.0	0.0	40.4	10.3	10.3
Agriculture	0.0	0.0	0.0	29.3	22.4	22.4	48.4	37.1	37.1	0.0	0.0	0.0	77.7	59.5	59.5
Other	0.0	0.0	0.0	0.0	0.0	0.0	2.1	1.2	1.2	0.0	NA	NA	2.1	1.2	1.2
Total (excl. LULUCF)	1032.2	828.1	790.6	99.3	45.9	45.7	84.4	62.4	62.1	11.9	16.0	13.1	1227.7	952.4	911.6

Source: Based on German Submission 09/2007

Table 3: Summary of projections by sector and by gas in 2010 compared to 1990 and base year 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	76.3	73.4	100	51.5	51.0	100	71.4	69.2	100	0.0	0.0	100	75.3	72.5
Energy supply	100	80.5	76.7	100	54.0	53.2	100	79.3	76.2	100	NA	NA	100	78.8	75.3
Energy – industry, construction	100	58.8	58.6	100	49.9	49.8	100	54.7	54.1	100	NA	NA	100	58.8	58.5
Energy – other (commercial, residential, agriculture)	100	80.6	77.7	100	27.8	29.3	100	62.4	61.8	100	NA	NA	100	79.9	77.0
Transport (energy)	100	95.7	86.6	100	12.5	11.9	100	188.6	172.8	100	NA	NA	100	95.4	86.3
Industrial processes	100	87.4	87.1	100	53.7	53.7	100	63.1	63.1	100	135.0	110.6	100	87.3	84.6
Waste	100	0.0	0.0	100	19.8	19.8	100	121.0	121.0	100	0.0	0.0	100	25.4	25.4
Agriculture	100	0.0	0.0	100	76.6	76.6	100	76.6	76.6	100	0.0	0.0	100	76.6	76.6
Other	100	0.0	0.0		0.0	0.0		56.0	56.0		NA	NA		56.0	56.0
Total (excl. LULUCF)	100	80.2	76.6	100	46.2	46.1	100	73.9	73.6	100	135.0	110.6	100	77.6	74.3

Source: Based on German Submission 09/2007

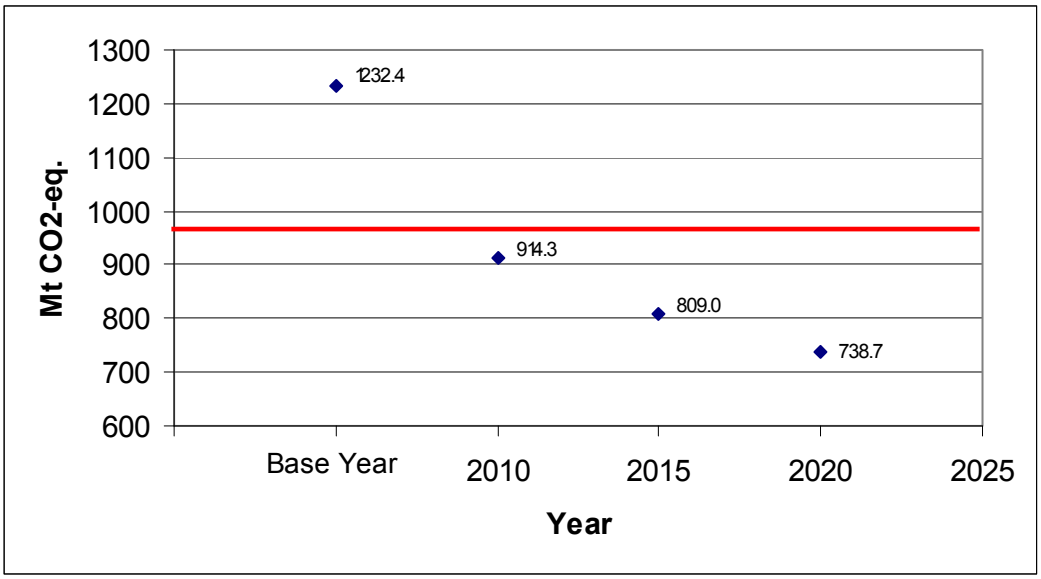
Table 4. Summary of projections in 2010 compared to base year emissions under the Kyoto Protocol

	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.	1 232.4	955.1	914.3
	Index (base-year emissions = 100)	100	77.5	74.2

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

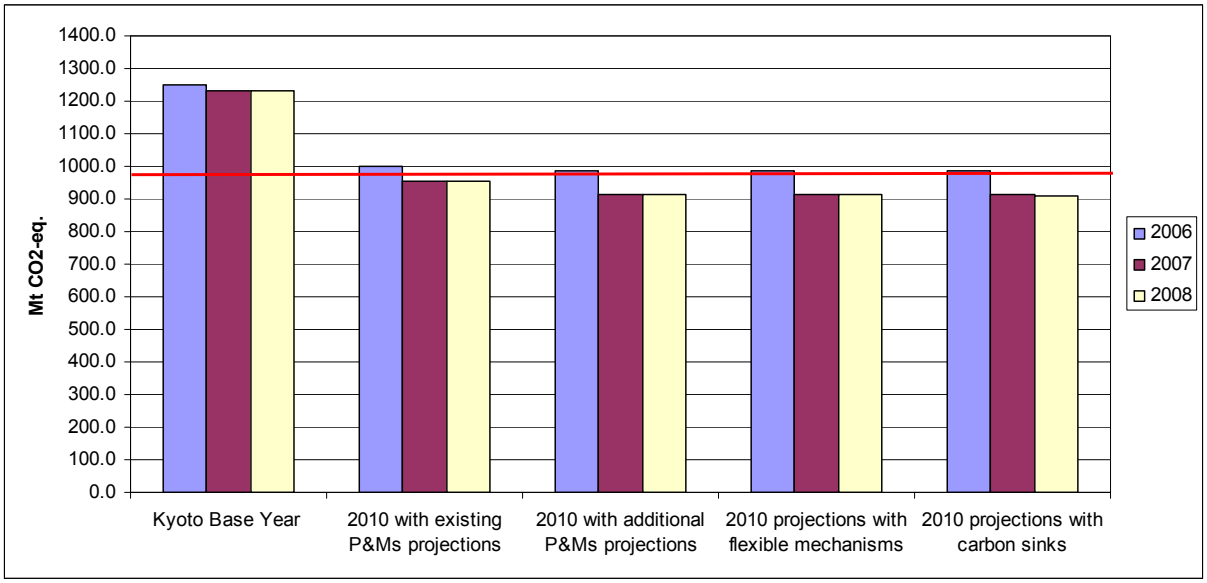
In Figure 1, the same correction factor used in Table 2 has been applied to the WAM projections for 2010, 2015 and 2020.

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



Source: Based on German Submission 09/2007

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



Source: For 2006 data: Germany's Monitoring Mechanism Submission 12/2005; for 2007 data: based on German Submission 09/2007; for 2008 data: same as 2007 and Questionnaire on the use of the Kyoto Protocol mechanisms and of sinks (2008)

3. CLIMATE CHANGE MITIGATION POLICIES AND MEASURES

The comparison of existing measures between the top-down and bottom-up approaches shows that the former estimate about 50% more emission reduction (73.4 Mt CO2-eq.) than the latter (47.5 Mt). However, one third of policies and measures (PAMs) have not been quantified. The largest emission reduction named in the PAMs result from transport (energy) (29.1 Mt = 61%), energy supply (11.2 Mt = 24%) and energy (other: commercial, residential, agriculture) (4.5 Mt = 9%).

The comparison of planned measures reveals that the projected emission reduction shows a similar relation, i.e. projected emission reduction (40.9 Mt) is 50% higher than the one of PAMs (25.8 Mt). The largest planned reductions result from transport (energy) (10.1 Mt = 39%), energy (other: commercial, residential, agriculture) (6 Mt = 23%) and energy supply (5 Mt = 19%).

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)	40.1	22.8	15.8	11.0
Energy supply	30.3	16.0	11.2	5.0
Energy – industry, construction	0.6	0.4	IE	IE
Energy – other (commercial, residential, agriculture)	9.2	6.3	4.5	6.0
Transport (energy)	20.4	15.0	29.1	10.1
Industrial processes	13.0	3.2	NO	NO
Waste	0.0	0.0	NO	NO
Agriculture	0.0	0.0	NO	NO
Cross-sectoral	0.0	0.0	2.6	4.6
Total (excluding LULUCF)	73.4	40.9	47.5	25.8

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 German Submission 09/2007

Table 6. Detailed information on Existing Policies and measures

Sector	Name	Type	GHG	Status	Absolute Reduction [kt CO_2-eq. p.a.] 2005	2010	2020	Costs [EUR/t]
Cross-cutting	Emissions Trading	Economic	CO_2	implemented		2 611	5 559	
Energy consumption	KfW CO2 incentive programme	Economic	CO_2	implemented		1 220	3 280	
Energy consumption	New incentive programme for modernisation of buildings	Economic	CO_2	implemented		360	960	
Energy consumption	City restructuring programme East	Economic	CO_2	implemented		40	110	
Energy consumption	Public housing programme	Economic	CO_2	implemented		70	190	
Energy consumption	On site consulting programme	Economic Information	CO_2	implemented		130	350	
Energy consumption	Market penetration programme Solar	Economic	CO_2	implemented		240	640	
Energy consumption	Market penetration programme Biomass	Economic	CO_2	implemented		830	2 200	
Energy consumption	Energy efficiency ordinance	Regulatory	CO_2	implemented		1 400	3 700	
Energy consumption	Energy labelling	Regulatory	CO_2	implemented		240	1 140	
Energy consumption	German Energy Agency (dena)	Information	CO_2	implemented				
Energy consumption	Incentive programme for energy advice	Economic	CO_2	implemented				
Energy consumption	Energy rehabilitation programme	Economic	CO_2	implemented				
Energy consumption	Information & motivation programmes	Information	CO_2	implemented				
Energy consumption	Other	Other	CO_2	implemented				

Energy consumption	Energy labelling ordinance	Information	CO_2	implemented		
Energy consumption	Energy efficiency initiative	Information	CO_2	implemented		
Energy supply	Renewable Energy Act	Economic Regulatory	CO_2	implemented		
Energy supply	Renewables R&D programme	Research	CO_2	implemented		
Energy supply	Abolition of gas tax for power generation	Fiscal	CO_2	implemented	2 597	6 219
Energy supply	Bonus for avoided network costs	Economic	CO_2	implemented	1 636	10
Energy supply	CHP Act	Economic	CO_2	implemented	7 000	3 500
Transport	Reduction of commuter tax breaks	Fiscal	CO_2	implemented	574	2 062
Transport	ACEA voluntary aggreement	Voluntary/ negotiated agreement	CO_2	implemented	6 272	8 141
Transport	Eco tax	Fiscal	CO_2	implemented	2 449	2 455
Transport	Highway toll for heavy duty vehicles	Fiscal	CO_2	implemented	2 360	2 572
Transport	Mandatory biofuel quotas	Regulatory	CO_2	implemented	17 444	18 143

Source: Öko-Institut, (accessed 17/07/2008), 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.] 2005	2010	2020	Costs [EUR/t]
Cross-cutting	Amendment of the National Allocation Plan and the Allocation Act beyond 2012	Economic	CO_2	Other		3 960	19 602	
Cross-cutting	Introduction of strict climate protection targets.	Economic	CO_2	Other		678	3 832	
Energy consumption	Extended incentive programme for high efficient heating systems	Economic	CO_2	Other		2 500	7 570	
Energy consumption	Extended incentive programme for use of renewable energies for heating and cooling	Economic	CO_2	Other		1 600	4 850	
Energy consumption	Extended incentive programme for energetic rehabilitation of buildings	Economic	CO_2	Other		1 330	4 670	
Energy consumption	Increase of efficiency standards for new buildings	Regulatory	CO_2	Other		600	1 800	
Energy consumption	Mandatory efficiency standards for additional electric appliances	Regulatory	CO_2	Other				
Energy consumption	Dynamisation of efficiency standards for electric appliances	Regulatory	CO_2	Other				
Energy consumption	Mandatory use of switches to avoid standyby losses	Regulatory	CO_2	Other				
Energy consumption	Mandatory labelling of standby losses	Information	CO_2	Other				

Energy consumption	Extension of dena initiatives to support energy efficieny of electric appliances	Information	CO_2	Other		
Energy supply	Amendment of the Renewable Energy Act	Economic Regulatory	CO_2	Other		
Energy supply	R&D	Research	CO_2	Other		
Energy supply	Amendment of the CHP Act	Economic	CO_2	Other	4 961	10 252
Transport	Cancellation of commuter tax breaks	Fiscal	CO_2	Other		2 229
Transport	Mandatory efficiency standards for new cars	Regulatory	CO_2	Other	844	10 726
Transport	Increse of diesel tax to the gasoline tax levels	Fiscal	CO_2	Other		1 889
Transport	Doubling of nominal user cost of trucks	Economic	CO_2	Other	2 338	7 833
Transport	Ambitious mandatory biofuel quotas	Regulatory	CO_2	Other		2 769
Transport	Mandatory use of low-friction oils and tyres	Regulatory	CO_2	Other	2 927	7 700
Transport	Introduction of CO2 based car taxation	Fiscal	CO_2	Other	3 375	2 582
Transport	Extension of highway toll scheme to full long distance network and trucks with gross vehicle weight of 3.5-12t.	Fiscal	CO_2	Other	636	5 035
Transport	Expansion of the EU ETS to aviation	Economic	CO_2	Other		200
Transport	Introduction of taxation of kerosene	Fiscal	CO_2	Other		2 730

Source: Öko-Institut, (accessed 17/07/2008), 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	Promotion of cogeneration 2004/8/EC	Energy supply
	Promotion of electricity from RE sources 2001/77/EC	Energy supply
	Taxation of energy products 2003/96/EC	Energy supply
	Transport modal shift to rail 2001/12/EC etc.	Transport
	Marco Polo programme on freight transport	Transport
	Support for rural development from EAGGF (1257/1999)	Agriculture
	Landfill directive 1999/31/EC	Waste
Existing national policies and measures **reinforced** by CCPM	Integrated pollution prevention and control 96/61/EC	Cross-cutting
	Energy performance of buildings 2002/91/EC	Energy consumption
	Efficiency of hot water boilers 92/42/EEC	Energy consumption
	Promotion of biofuels for transport 2003/30/EC	Transport
	Integrated European railway area (COM(2002)18 final)	Transport
	Agreement with car manufacturers ACEA etc.	Transport
	Motor challenge, voluntary EC programme	Energy consumption
	F-gas regulation (842/2006)	Industrial Process
	Support scheme for energy crops under CAP (795/2004)	Agriculture
	Nitrates directive 91/676/EEC	Agriculture
	Support under CAP (1782/2003)	Agriculture
	Support under CAP - amendment (1783/2003)	Agriculture
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
	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
	Ecodesign requirements for energy-using products 2005/32/EC	Energy consumption
	End-use efficiency and energy services 2006/32/EC	Energy consumption
	Eco-management & audit scheme (EMAS) EC 761/2001	Energy consumption
	Efficiency fluorescent lighting 2000/55/EC	Energy consumption
	Consumer information on cars 1999/94/EC	Transport
Status of national policy or measure **not reported**	Energy labelling for office equipment 2422/2001	Energy consumption
	HFCs in mobile air conditioning 2006/40/EC	Transport
	Rural development support and CAP(2603/1999, 1698/2005 and 1290/2005)	Agriculture
	Pre-accession measures for agriculture and rural development (1268/1999)	Agriculture
	Packaging and packaging waste (94/62/EC, 2004/12/EC, 2005/20/EC)	Waste
	Directive on waste 2006/12/EC	Waste

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

Germany had half the number of PAMs already in force before or reinforced by CCPMs with a slight focus on the transport and agriculture sectors. A third of all PAMs have been implemented after the adoption of

CCPMs, particularly in energy consumption; the status of one sixth of the CCPMs has not been reported.

4. METADATA

Sources of information

- Politikszenarien IV - Szenarien für den Projektionsbericht 2007 [Policy Scenarios IV – Scenarios for the Projection Report 2007]. Umweltbundesamt (UBA), January 2008 [submitted under the monitoring mechanism, September 2007]
- Germany's 4th National Communication; Fourth National Report by the Government of the Federal Republic of Germany (July 2006)
- • Integrated Energy and Climate Programme - Decision of German Cabinet on August 23rd/24th 2007 at Meseberg
- Questionnaire on the use of the Kyoto Protocol mechanisms and of sinks in meeting the Kyoto targets (2008)
- German National Inventory Submission to the UNFCCC, 15 April 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 (CO_2), methane (CH_4) and nitrous oxide (N_2O) and 1995 emissions for fluorinated gases (SF_6, 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 o (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	+++	Clear names
Objectives of policies	++	Descriptions in the text
Types of policies	++	Some not clear
Which greenhouse gases?	++	Some not precised clearly
Status of Implementation	++	Status of implementation is mostly given.
Implementation body	+++	
Quantitative assessment of emission reduction effect and cost of policies	++	In most cases stated.
Interaction with other national and EU level policies	+	Only stated in few cases.
Measures implementing community legislation	+	Only stated in some cases.
Arrangements for flexible mechanisms	+++	No use of flexible mechanisms.
Balance between domestic action and flexible mechanisms	+++	No use of flexible mechanisms.

Table 10. Information provided on projections

Category of Information	Level of information provided	Comments
Projection scenarios	+++	Projections without, with and with additional measures are provided.
Policies included in each projection	++	
Expressed relative to historic reference year data	+++	
Starting year	++	
Split of projections	+++	Detailed sectoral split, all gases projected
Presentation of results	+++	Detailed background study with assumptions and results

Description of methodologies	+++	Included in background study.
Sensitivity analysis	++	
Discussion of uncertainty	+	
Details of parameters and assumptions	+++	Most parameters are available
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)	2129.33	2305.28	2487.33	2669.38	Billion €
Population (value at given years or annual growth rate and base year)	82438.0	82411.0	81902.0	81393.0	Thousand People
International coal prices at given years in euro per tonne or GJ (Gigajoule)	2.11	1.81	1.79	1.77	€/GJ at 29.308 GJ/tce
International oil prices at given years in euro per barrel or GJ	7.00	8.25	8.13	8.02	€/GJ at 42.779 GJ/t
International gas prices at given years in euro per m3 or GJ	4.27	4.44	4.31	4.17	€/GJ (HHV)
Assumptions for the energy sector					
Total gross inland consumption (PJ) (split by oil, gas, coal, renewables, nuclear, other)	12071.00	12285.00	12041.00	12211.00	PJ
6a. - Oil (fossil)	4985.18	4938.89	4761.16	4738.26	PJ
6b. - Gas (fossil)	2774.24	2869.57	2823.66	2889.24	PJ
6c. – coal (Hard coal and lignite)	3699.91	3584.06	3429.59	3390.53	PJ
6d. – Renewables	612.15	892.43	1027.02	1192.56	PJ
6e. - Nuclear (IEA definition for energy calc.)	1863.90	1587.81	1195.46	489.07	PJ
6f. Net Electricity import (-+)					PJ
6g. - Other solid fuels	99.0	118.2	136.6	155.5	PJ
Total electricity production by fuel type (oil, gas, coal, renewables, nuclear, other)	414253.0	445358	470062	527988	Gwhe
7. - Oil (fossil)	4599.8	2709.5	819.3	532.4	Gwhe
8. - Gas (fossil)	41729.9	45785.4	49840.9	74096.7	Gwhe
9. – coal (Hard coal and lignite)	301033.0	306898	312763.4	328419.4	Gwhe
10. – Renewable	66890.0	89964.6	106638.0	124939.5	Gwhe
11. Nuclear (IEA definition for energy calc.)	152468.0	169606.3	144484.2	108781.6	Gwhe
12. - Blast furnace gas, coke oven gas, waste, including non-hydro renewables for 1990	19047.0	20890.8	22734.5	24492.6	Gwhe
Energy demand by sector split by fuel (delivered)	12510.32	12316.48	11622.00	11004.13	PJ
13. Energy Industries	5877.00	5622.92	5163.16	4691.82	PJ
13a. Oil (fossil)	520.13	448.93	403.96	392.10	PJ
13b. Gas (fossil)	218.55	310.48	316.75	440.92	PJ
13c. Coal (Hard coal, lignite and other solid fuels)	2984.12	2853.77	2725.37	2718.90	PJ
13d. Renewables	290.19	421.92	521.63	650.82	PJ
13e. -- Nuclear (IEA definition for energy calc.)	1863.90	1587.81	1195.46	489.07	PJ
13e. - Electricity	14312.99	12494.85	11664.93	11855.22	PJ
14. Industry	1490.15	1399.20	1338.00	1276.80	PJ
14a. Oil (fossil)	178.60	170.20	162.45	154.70	PJ
14b. Gas (fossil; Natural gas, blast furnace gas, coke oven gas, refinery gas, LPG)	847.20	756.30	714.95	673.60	PJ
14c. Coal (Hard coal, coke and lignite)	446.05	450.10	435.50	420.90	PJ
14d. Renewables (including waste)	18.30	22.60	25.10	27.60	PJ
14e. - Electricity and district heat	227597	229083	228972	228861.11	PJ

15. Commercial (Tertiary)	959.79	1012.71	969.91	928.30	PJ
15a. Oil (fossil)	378.91	390.03	350.49	310.64	PJ
15b. Gas (fossil)	543.54	562.95	548.49	535.55	PJ
15c. coal	28.00	47.00	44.15	41.30	PJ
15d. Renewables	9.34	12.74	26.78	40.81	PJ
15e. - Electricity and district heat	154015.0	153812.31	150102.3	146392.3	PJ
16. Residential	1952.95	2019.31	1951.28	1885.87	PJ
16a. Oil (fossil)	659.46	676.68	648.67	621.82	PJ
16b. Gas (fossil)	1058.77	1076.10	1023.14	972.62	PJ
16c. coal	45.03	46.67	44.44	42.77	PJ
16d. Renewables	189.69	219.86	235.03	248.66	PJ
16e. - Electricity and district heat	190405.6	194898.5	189244.2	183981.12	PJ
17. Transport	2230.54	2262.24	2199.65	2221.34	PJ
17a. Oil (fossil)	2107.81	2018.08	1928.35	1925.56	PJ
17b. Gas (fossil)	0.97	6.21	27.46	48.22	PJ
17d. Renewables	121.76	238.05	243.84	247.56	PJ
17e. - Electricity and hydrogen	37080.11	36077.9	36230.6	36401.96	PJ
Assumptions on weather parameters, especially heating or cooling degree days					
18a. Heating Degree Days					Annual HDD
18b. Cooling Degree Days					Annual CDD
Assumptions for the industry sector					
For Member States using macroeconomic models:					
The share of the industrial sector in GDP and growth rate					
For Member States using other models:					
The production index for industrial sector (2000=100; no consistent data available for 1990 and 2005)					Index (2000=100)
Mining and quarrying		90.48	90.48	90.48	Index (2000=100)
Food and tabacco		101.41	104.51	107.61	Index (2000=100)
Pulp and paper		102.06	103.61	105.15	Index (2000=100)
Basic chemicals		106.77	113.02	119.27	Index (2000=100)
Other chemical industry		114.22	123.77	133.33	Index (2000=100)
Rubber and plastic products		112.31	120.51	128.72	Index (2000=100)
Glass, ceramics		87.93	87.93	87.93	Index (2000=100)
Mineral products		80.41	78.87	77.32	Index (2000=100)
Ferrous metals		100.00	97.54	95.08	Index (2000=100)
Non-ferrous metals		103.90	107.14	110.39	Index (2000=100)
Metal products		113.01	122.58	132.14	Index (2000=100)
Machinery		116.33	132.75	149.17	Index (2000=100)

Motor vehicles and transport equipment		121.57	131.91	142.26	Index (2000=100)
Assumptions for the transport sector					
For Member States using macroeconomic models:					
The growth of transport relative to GDP					
For Member States using other models:					
The growth of passenger person kilometres		1086000		1153000	Million passenger km
The growth of freight tonne kilometres		604000		731000	Million tonne km
Assumptions for buildings (in residential and commercial or tertiary sector)					
For Member States using macroeconomic models:					
The level of private consumption (excluding private transport)					
The share of the tertiary sector in GDP and the growth rate					
For Member States using other models:					
The rate of change of floor space for tertiary buildings and dwellings					
The number of dwellings and number of employees in the tertiary sector					
31a. The number of dwellings	39178.00	39665.0	39843.0	40021.00	1000 dwellings
31b. Number of employees in the tertiary sector		29963.0	30267.0	30571.00	1000 employees
Assumptions in the agriculture sector					
For Member States using macroeconomic models:					
The share of the agriculture sector in GDP and relative growth					
For Member States using other models:					
Livestock numbers by animal type (for enteric fermentation beef, cows, sheep, for manure management pigs and poultry)					
The area of crops by crop type					
Emissions factors by type of livestock for enteric fermentation and manure management (t)					
Assumptions in the waste sector					
Waste generation per head of population or tonnes of municipal solid waste	40900.0	40900.0	40900.0	40900.0	kt
The organic fractions of municipal solid waste	28.00	28.00	28.00	28.00	%
Municipal solid waste disposed to landfills, incinerated or composted (in tonnes or %)					
51. Municipal solid waste disposed to landfills	3.00	0.00	0.00	0.00	%
52. Municipal solid waste disposed incinerated	38.00	46.00	46.00	46.00	%
53. Municipal solid waste disposed composted	35.00	48.00	48.00	48.00	%
Assumptions in the forestry sector					
Forest definitions					
Areas of:					
managed forests					
unmanaged forests					

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					
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					
Assumptions for the industry sector					
Assumptions fluorinated gases:					
Aluminium production and emissions factors					
Magnesium production and emissions factors					
Foam production and emissions factors					
Stock of refrigerant and leakage rates					
For Member States using macroeconomic models:					
Share of GDP for different sectors and growth rates					
Rate of improvement of energy intensity (1990 = 100)					
For Member States using other models:					
Index of production for different sectors					
Rate of improvement or index of energy efficiency					
Assumptions for buildings (in residential and commercial / tertiary sector)					
For Member States using macroeconomic models:					
Share of tertiary and household sectors in GDP					
Rate of improvement of energy intensity					
For Member States using other models:					
Number of households					
Number of new buildings					
Rate of improvement of energy efficiency (1990 = 100)					
Assumptions for the transport sector					
For Member States using econometric models:					
Growth of transport relative to GDP split by passenger and freight					
Improvements in energy efficiency split by vehicle type					
Improvements in energy efficiency split by vehicle type, whole fleet/new cars					
Rate of change of modal split (passenger and freight)					
Growth of passenger road kilometres					
Growth of passenger rail kilometres					
Growth of passenger aviation kilometres					
Growth of freight tonne kilometres on road					
Growth of freight tonne kilometres by rail					
Growth of freight tonne kilometres by navigation					
Assumptions for the agriculture sector					
For Member States using econometric models:					
Agricultural trade (import/export)					
Domestic consumption (e.g. milk/beef consumption)					
For Member States using other models:					
Development of area of crops, grassland, arable, set-aside, conversion to forests etc					
Macroeconomic assumptions behind projections of agricultural activity					
Description of livestock (e.g. by nutrient balance, output/animal production, milk production)					
Development of farming types (e.g. intensive conventional, organic farming)					
Distribution of housing/grazing systems and housing/grazing period					
Parameters of fertiliser regime:					
Details of fertiliser use (type of fertiliser, timing of application, inorganic/organic ratio)					

Volatilisation rate of ammonia, following spreading of manure on the soil					
Efficiency of manure use					
Parameters of manure management system:					
Distribution of storage facilities (e.g. with or without cover):					
Nitrogen excretion rate of manures					
Methods of application of manure					
Extent of introduction of control measures (storage systems, manure application), use of best available techniques					
Parameters related to nitrous oxide emissions from agricultural soils					
Amount of manure treatment					