

# Portugal

## Sources of information

The information in this appendix is based on:

- Portuguese Greenhouse Gas Inventory 2000
- 1st version of Portuguese Climate Change National Program — resume of updated existing policies and measures presented on ‘Workshop on energy-related national and EU-wide projections of GHG emissions, 27–28 Feb 2002’, by Alvaro Martins, CEEETA, ISEG — Technical University of Lisbon

A National Program for Climate Changes is being prepared. A first version for public discussion has been published at the end of 2001 (<http://www.iambiente.pt>) and a new version will be prepared till the end of 2002. This document is the source for the listed Policies and Measures. The figures presented in this appendix are those considered in the 2001 version of the National Program, as proposed in GASA-DCEA-FCT(2000)<sup>1</sup>. The projections considered are now being revised.

## Quality and transparency of reporting

The National Program, in its 2001 version, presents a first list of policies and measures that will reduce greenhouse gas emissions in a range of sectors including electricity production, refineries, combustion in industry, transport and waste. However, the impact of these policies and measures has not yet been completely quantified in relation to a baseline projection and the costs of the measures are being estimated.

**Table 1: Information provided on policies and measures**

Information provided	Level provided	Comments
Policy names	+++	
Objectives of policies	++	Further details of policy objectives provided at meeting
Which greenhouse gases?	CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O	
Status of implementation	+	Some details given at meeting
Implementation body specified	+	Some details given at the meeting
Quantitative assessment of implementation	–	To be defined
Interaction with other P&Ms discussed	+	Being considered

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

The latest projections contain a ‘without measures’ scenario, covering CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFCs, HFCs and SF<sub>6</sub>, with the first projection year being 2000. Actual inventory data for all six GHGs is presented for the years 1990 to 2000. Projections have been made for the years 2000, 2005 and 2010. These projections are now being revised for the period 2000–2015. Emissions from international transport are included. The overall methodology for projected emissions is well described and the major assumptions are presented.

<sup>1</sup> GASA-DCEA-FCT (2000), *Emissão e controlo de gases com efeito de estufa em Portugal. Ministério do Ambiente e do Ordenamento do Território, Março 2000*

**Table 2: Information provided on projections**

Category of information	Level of information provided	Comments
Scenarios considered	Without measures	Only one scenario provided.
Expressed relative to inventory for previous years	+++	
Starting year	2000	First year for which projection is made
Split of projections	+++	
Presentation of results	+++	
Description of model (level of detail, approach and assumptions)	++	
Discussion of uncertainty	–	
Details of parameters and assumptions	++	Discussion of parameters and assumptions

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

## Assessment of policies and measures

The effects of policies and measures affecting the energy, industry, transport and waste sectors will be included in the 'with measures' scenario to be considered in the 2002 revision.

A 'without measures' projection has been provided, which enables the measure of the mitigation effort to be attained with the sets of policies and measures to be approved.

**Table 3: Summary of the effect of policies and measures included in the projections (MtCO<sub>2</sub>)**

	With measures <sup>a</sup>	With additional measures <sup>b</sup>
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Total

Note: This summary was not available at the time of preparation of the report

Details of policies and measures are provided below. This information has been published in the National Program for Climate Change<sup>2</sup>. These new policies and measures are split into immediate (existing) and additional measures.

<sup>2</sup> MAOT (2002), Programa Nacional para as Alterações Climáticas, Março 2002 (<http://www.iambiente.pt>)

**Table 4: Detailed information on policies and measures**

Sector	Name	Objective	GHG affected	Type of instrument	Status	Implementing entity	Estimate of savings (MtCO <sub>2</sub> )		CCPM
							2010	2020	
Energy supply	Renewables electricity supply	Electricity generation and supply	Mainly CO <sub>2</sub>	Economic, regulatory	In implementation	Ministry of Economy	3.3–4.1		y
Energy supply	Energy efficiency in the electric system	Energy efficiency in electricity supply	Mainly CO <sub>2</sub>	Technical	In implementation	Not given	0.7		n
Industry	Emissions control and RUE	Reduction in emissions	CO <sub>2</sub> and F-gases	Economic, regulatory	In implementation	Ministry of Environment Ministry of Economy	0.71		y
Residential and services	Renewables development and solar hot water	Switching to renewable energy	Mainly CO <sub>2</sub>	Economic Fiscal	In implementation	Ministry of Economy Ministry of Finance	0.5		n
Residential and services	National programme for RUE in buildings	Energy consumption reduction Targets	Mainly CO <sub>2</sub>	Regulatory	Adopted	Ministry of Economy	–0.65		n
Waste/Residues	Waste plans for Industry, urban waste and hospital residues	Increasing the waste valorization practices	CH <sub>4</sub>	Regulatory	In implementation	National Waste Institute	0.4		y
Waste/Residues	IPPC directive	Not given	CH <sub>4</sub>	Regulatory	In implementation	Environmental Institute	Not given		y

## Evaluation of projections

The 'without measures' projection shows total greenhouse gases (excluding LUCF) increasing by 40.9 %\* between 1990 and 2010. This compares to Portugal's commitment under the EU burden sharing agreement of +27 %

**Table 5: Summary of projections by gas in 2010 (MtCO<sub>2</sub>eq.)**

	Base year	Without measures (reference scenario)	With additional measures
CO <sub>2</sub> *	44.1	74.3	
CO <sub>2</sub> **	40.3	69.6	
CH <sub>4</sub>	12.88	8.0	
N <sub>2</sub> O	7.63	8.6	
PFCs	0.16	0.16	
HFCs		1.92	
SF <sub>6</sub>	0.91	0.002	
Total *	64.9	91.5	
Total **	61.2	88.3	
% change relative to base year*		40.9 %	
% change relative to base year**		44.3 %	

\*Projection excludes sinks

\*\*Projection includes sinks

Halogenated gases have a base year of 1995, all other gases have 1990 as the base year.

**Table 6: Summary of projections by sector in 2010 (MtCO<sub>2</sub>eq.)**

	Base year	Without measures	% change relative to 1990	With additional measures	% change relative 1990 (additional measures)
CO <sub>2</sub> eq.		(a)			
Energy	39.7		71 %		
Industrial Processes	4.1		59 %		
Solvent use	0.3		20 %		
Agriculture	0.0		–		
Land use change and forestry	–3.7		18 %		
Waste	0.01		5356 %		
Non-CO <sub>2</sub> eq. gases	20.8	(a)	31 %		
Total *	64.9	91.5	40.9 %		
Total**	61.2	88.3	44.3 %		

\*Excludes sinks

\*\*Includes sinks

(a) The projections have not taken into account this breakdown.

**Table 7: Assessment of the target**

	MtCO <sub>2</sub> equiv.*	% of 1990 level (six gas basket)
Base year (from projections)	64.90	
Commitment	82.50	27.0 %
Without existing P&Ms	91.50	40.9 %
Gap (-ve means no gap)	9.00	13.9 %
Effect of existing and additional P&Ms	na	

\*Totals exclude sinks

## Description of modelling approach

Emission projections are based on existing sectoral activity projections from various government departments including Energy, Agriculture and Forests and on various national and EU plans.

In the case of demand side energy related emissions (mostly CO<sub>2</sub>), these are calculated from energy use figures contained in a 1999 study by the General Directorate of Energy (DGE), which used as its basis a variant of the MEDEE simulation model. Structural changes and efficiency improvements are incorporated in the model on the basis of exogenously specified growth rates and autonomous energy efficiency improvements respectively.

For electricity production, emissions are calculated from the Plan of Expansion of the Public Electric System performed by the national grid company (REN) and DGE.

Emissions from land transport are also based on energy consumption projections from DGE.

Agricultural emissions of methane are based on the forecast of livestock numbers from the Ministry of Agriculture and Forests. In the case of methane from waste, the projections are based on the Waste Strategic Plan from the National Waste Institute.

For nitrous oxide, emissions from agriculture take account of a general increase in the intensity of fertiliser usage, as well as an expansion of irrigated areas in the south of the country which is expected to lead to higher fertiliser application rates.

### Modelling parameters

Parameter	2000	2010	Unit
Population	10.02	10.2	Million
GDP	17.06	23.84	10 <sup>9</sup> PTE 95
Oil (International price)	23	28	US\$ (1995)/bbl
Coal (International price)	54	57	US\$ (1995)/t
Transport Passenger growth	85447	131984	Passenger/km (millions)
Freight growth	23715	40125	Tonnes/km (millions)

Source: DGE (1999) A Procura de Energia em Portugal, 2000–2020

## Country conclusions

Portugal is preparing a National Program on Climate Change, with the involvement of the relevant stakeholders. A first version aiming to measure the mitigation effort and to facilitate the discussion with the agents concerned has been published<sup>2</sup>. By the end of 2002 a revised version will be presented, considering both the without and with measures.

In terms of measures, a distinction will be made between immediate, additional and reserve sets of measures. In the next version of the National Program a ‘commitment scenario’ will be analysed and the adequate policies and measures and instruments as well as their emission impacts and costs will be proposed.

Portugal aims not to exceed its commitment under the EU burden sharing agreement.