PORTUGUESE ENVIRONMENT AGENCY

2ND BIENNIAL REPORT TO THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE

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AUTHOR: PORTUGUESE ENVIRONMENT AGENCY
CLIMATE CHANGE DEPARTMENT

EDUARDO SANTOS
JOSÉ PAULINO
RUI PAPUDO

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I. ACRONYMS

APA	Portuguese Environment Agency
ARA	Autonomous Region of the Azores
ARM	Autonomous Region of Madeira
CC	Climate Change
CPLP	Community of Portuguese Speaking Countries
CRF	Common Report Format
EMEP	European Monitoring and Evaluation Programme
ENAAC	National Climate Change Adaptation Strategy
EU	European Union
EU ETS	European Union Emissions Trading Scheme
FPC	Portuguese Carbon Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gas
HFC	Hydrofluorocarbons
HW	Heat Wave
INE	National Statistics Institute
INERPA	National Inventory of Anthropogenic Emissions by Sources and Removals by Sinks of Air Pollutants
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
LULUCF	Land Use, Land-Use Change and Forestry
NIR	National Inventory Report
NMVOC	Non-methane Volatile Organic Compound
ODA	Official Development Assistance
OECD	Organization for Economic Cooperation and Development
PALOP	Portuguese Speaking Countries of Africa
PEC	Primary Energy Consumption
PEN	National Energy Plan
PNAC	National Programme for Climate Change
PNDFCI	National Plan for the Protection from Forest Fires
RCM	Resolution of the Council of Ministers
RCP	Representative Concentration Pathways
RES	Renewable Energy Sources
SIRAPA	Integrated System of Registration of the Portuguese Environmental Agency
SNIERPA	National Inventory System of Emissions by Sources of Removals by Sinks of Air Pollutants
UNFCCC	United Nations Framework Convention on Climate Changes

II. ACKNOWLEDGEMENTS

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III. INTRODUCTION

This report constitute the second Biennial Report of Portugal, as required under Article 18(1) of Regulation (EU) No 525/2013 and Decision 2/CP.17 of the Conference of the Parties under the United Nations Framework Convention on Climate Change (UNFCCC).

IV. INFORMATION ON GREENHOUSE GAS EMISSIONS AND TRENDS

A. BACKGROUND INFORMATION

1. The Convention, the Kyoto Protocol and National Commitments

The UNFCCC appeared as the response of the international community to the emerging evidences of Climate Change (CC), having as its ultimate objective the *stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system*. and the UNFCCC was adopted and opened for signature in Rio de Janeiro in 1992 and Portugal ratified it on 31st of May of 1994.

The Kyoto Protocol (KP), adopted in 1997, implies a deepening in the commitments inscribed in the Convention. The KP introduced legally binding commitments for developed countries to reduce their collective emissions of GHG by at least 5% by the period 2008-2012 (1stcommitment period of the KP), below their 1990 level.

Portugal signed the KP on 29thof April of1998 and ratified it on 31stof May of 2002. The European Union (EU) as a whole agreed to a -8% reduction and under the EU burden-sharing agreement, Portugal pledged to limit its emissions during the 1stcommitment period at levels no greater than +27%comparing to the 1990 values.

The KP entered into force on the 16th of February of 2005, after Russia's ratification in November of 2004 which fulfilled the requirement that at least 55 Parties to the Convention, including developed countries representing 55% of the level of their emissions in 1990.

Detailed rules for the implementation of the KP were set out at the 7th Conference of the Parties[1] (COP) and are described in the Marrakech Accords adopted in 2001. At the *1st Conference of Parties serving as the Meeting of the Parties to the Protocol*[2] were adopted the KP's implementation rules agreed at the COP7.

B. NATIONAL INVENTORY

1. General Information

i. History of national inventories

Air emission inventories in Portugal were initiated in the late 80's, early 90's when the first estimations of NO_x, SO_x and VOC emissions from combustion where made under the development of the National Energetic Plan (PEN), and emissions from combustion and industrial processes were made under the Organization for Economic Co-operation and Development (OECD) inventory and CORINAIR85 programme. A major breakthrough occurred during the CORINAIR90 inventory realized during 1992 and 1993 by the General-Directorate of Environment[3].

This inventory exercise, aiming also to respond to the European Monitoring and Evaluation Programme (EMEP) and OECD/IPCC, extended the range of the pollutants[4] and emission sources covered, including not only combustion activities but also:

- Storage and distribution of fossil fuels;
- Production processes;

[1] Held in Marrakech (Morocco).

[2] held in Canada in December of 2005.

[3] Currently designated as APA.

[4] SO_x, NO_x, NMVOC, CH_4, CO, CO_2, N_2O and NH_3.

- Use of solvents;
- Agriculture;
- Urban and industrial wastes and nature (forest fires and NMVOC from forest).

The information received under the Large Combustion Plant (LCP) directive was also helpful to improve inventory quality and the individualization of Large Point Sources, as well as statistical data received from the National Statistical Institute (INE) which allows an amplification of the activity data coverage (more emission sources). The *CORINAIR90 Default Emission Factors Handbook* (2nd edition), updating the 1st edition from CORINAIR85 was used extensively in the development of the current inventory and it was also a key point in the enhancement of the inventory.

The fulfilment of international commitments under the UNFCCC and Long-range Transboundary Air Pollution(CLRTAP) conventions, together with the publication of the *IPCC Draft Guidelines for National Greenhouse Gas Inventories* (IPPC, 1995) and the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories* (IPCC, 1997), it generated a substantial improvement of the methodologies applied in the inventory process, with a particularly emphasis to agriculture and waste, and that were included at first time in the Portuguese *1st National Communication*(1994).

The results attained by the CORINAIR90 (CEC,1992) and the following adjustments imposed by the IPCC methodology are the main structure of the current inventory approach in what concerns activity data and methodology. Under the evaluation process of the 1st Communication, the inventory was revised by an international experts group (IEG). The 2nd, 3rd, 4thand 5thcommunications were also reviewed by IEG and these exercises had an important role in the problem's revealing and contribute to overall improvement.

Since its first compilation, the Portuguese Inventory has been continuously revised due to the use of the following progress measures:
Appeal for more advanced methodologies;
Better access to core data which allows the development of comprehensiveness of the inventory;
Better database storage, calculation process and procedures.

All the methodological changes, the source coverage or scope of the data were reflected in the estimation of the emissions for the different years considered (1990-2011), i.e., the inventory is internally consistent.

Greenhouse gas emissions inventories

Parties to the Convention (Article 4(1)(a)) "shall develop, periodically update, publish and make available to the COP, …., national inventories of anthropogenic emissions by sources and removals by sinks of all GHG not controlled by the Montreal Protocol, using comparable methodologies".

Portugal, as a Party to the Convention, is required to produce and regularly update National GHG Inventories. Furthermore Parties shall submit a National Inventory Report (NIR) containing detailed and complete information on their inventories, in order to ensure the transparency of the inventory.

The inventory covers the six gaseous air pollutants included in Annex A[5] to the KP, as well as estimates for indirect GHGs (CO, NO_x and NMVOC) and data regarding SO_x. Emissions are estimated for each civil year from 1990 to 2013.

As a general rule, the inventory covers emissions occurring in the whole Portuguese territory (mainland and the Madeira and Azores Archipelagos[6]). The emissions from air traffic and navigation generated in the Portuguese Territory include the movements between mainland and islands, information included in the total of national emissions.

With regard to the economic sectors covered, the inventory considers the following:

[5] CO_2, CH_4, N_2O, HFC, PFCs, SF_6 and NF3.

[6] This two archipelagos of the Portuguese Territory are Autonomous Regions.

- Energy production and transformation;
- Combustion in industry;
- Domestic;
- Agriculture;
  Fisheries;
- Institutional and commerce sectors;
- Transportation (road, rail, maritime and air);
- Industrial production and use of solvents;
- Waste production, disposition and treatment[7];
- Animal husbandry emissions;
- Emissions and removals from forestry and land use change.

ii. Global warming potentials

The former GWP considered in the *IPCC Second Assessment Report*[8](SAR)have been replaced by the values proposed by the *IPCC Fourth Assessment Report*[9](AR4), as required by the revised UNFCCC reporting guidelines.

2. Institutional Arrangements for Inventory Preparation

i. Institutional arrangements in place

In order to comply with the commitments at the international and EU levels, a National Inventory System of Emissions by Sources and Removals by Sinks of Air Pollutants (SNIERPA) was created. This system contains a set of legal, institutional and procedural arrangements that aim at ensuring the accurate estimation of emissions by sources and removals by sinks of air pollutants, as well as the communication and archiving of all relevant information.

The main purpose of the SNIERPA is to prepare and ensure the transparency, consistency, comparability, completeness, accuracy and timeliness of the inventory of air pollutants, in accordance with the directives defined at international and EU levels, in order to make easier and more cost-effective the tasks of inventory planning, implementation and management,

This system was first established in 2005 through a Council of Ministers Resolution[10], which defined the entities relevant for its implementation based on the principle of institutional cooperation. This clear allocation of responsibilities is essential to ensure the inventory takes place within the defined deadlines.

A new legal national arrangement has been adopted in 2015[11] in order to take into account the recent developments at international level relating to the UNFCCC and the KP, and the new monitoring and reporting requirements provided at the EU level by Regulation (EU) 525/2013 of the European Parliament and of the Council of 21 May 2013, on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to Climate Change and repealing Decision N.º 280/2004/EC, and the Commission Implementing Regulation (EU) 749/2014 of 30 June 2014 on structure, format, submission processes and review of information reported by Member States pursuant to Regulation (EU) N.º 525/2013 of the European Parliament and of the Council, and the requirements under the CLRTAP and the NECD.

Figure 1 presents the institutional framework and the main entities that compose the national system.

[7] Urban, industrial and hospitals solid wastes, and domestic and industrial waste water.

[8] IPCC, 1996.

[9] IPCC, 2007.

[10] RCM n.º 68/2005 of 17th of March.

[11] RCM n.º 20/2015 of 14th of April.

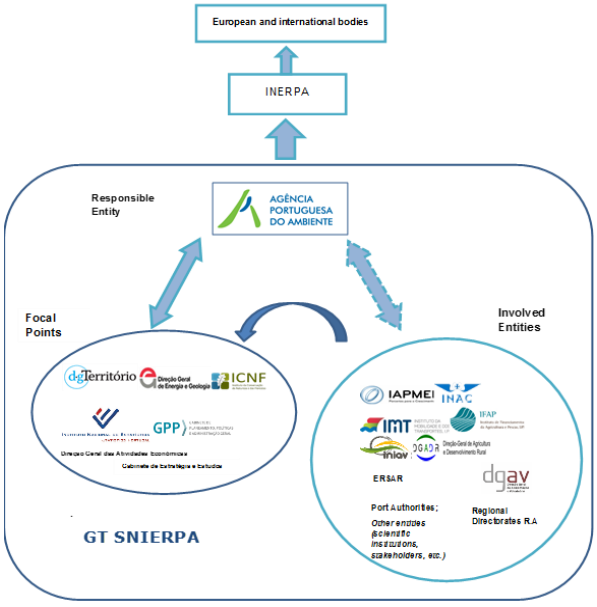

Figure 1: Institutional arrangements of the National System

The 2014 inventory submission provides some changes in the institutional arrangements which refer to an update and enlargement of the number of the members that make part of SNIERPA and the reassignment of experts acting as Focal Points (FP).

For efficiency purposes SNIERPA includes a wider group of air pollutants than just the GHG not covered by the Montreal Protocol, allowing for improvements in information quality, as well as an optimization of human and material resources applied to the preparation of the inventory.

The Portuguese Environmental Agency[12] (APA)is responsible for:

- The overall coordination and updating of the National Inventory of Emissions by Sources and Removals by Sinks of Air Pollutants (INERPA);
- The inventory's approval, after consulting the FP and the involved entities;
- The submission of the information required by the EC and international bodies, whose formats and communications ensure their comply with the adopted requirements and directives.

The sectorial FP work with APA in the preparation of INERPA, and are responsible for fostering intra and inter-sectorial cooperation to ensure a more efficient use of resources. Their main task includes coordinating the work and participation of the relevant sectorial entities over which it has jurisdiction. It is also the FP duty to provide expert advice on methodological choice, emission factor determination and accuracy of the activity data used. The FP plays a vital role in sectorial quality assurance and methodological development.

The involved entities are public or private bodies which generate or hold information which is relevant to the INERPA, and which actions are subordinate to the FP or directly to the Responsible Body.

All governmental entities have the responsibility to ensure, at a minimum, co-funding of the investment needed to ensure the accuracy, completeness and reliability of the emissions inventory.

The INERPA working group is composed by several public administration bodies and organizations which purpose is to support the annual production of the PTi and the fulfilment of the reporting requirements.

More information can be found in Portugal's National Inventory Report.

[12]A public administration body under the political responsibility of the Ministry for the Environment, Land Use Planning and Energy.

C. EMISSION TRENDS

1. Overall greenhouse gas emission trends

In 2013, the Portuguese GHG emissions (Figure 2) without land-use, land-use change and forestry (LULUCF) were estimated at about 65.1 Mt CO_2eq, which represents an increase of 7.69% compared to 1990 levels and a decrease of 2.8% compared to the previous year (2012).

Throughout this report, emissions values are presented in CO_2eq using IPCC AR4 GWP values.

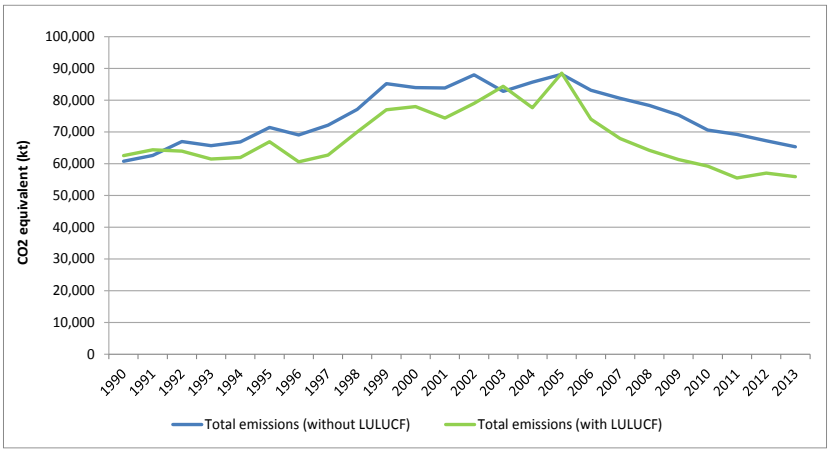

Figure 2: Total of GHG emissions

After a steady increase of emissions during the 90's, the growth of emissions has been moderate until reaching a period of stagnation in the early 2000's. After 2005 we see a consistent downward trend. These trends reflect the evolution of the Portuguese economy and investments in cleaner energy sources such as natural gas (replacing coal) and renewable energy sources (RES).

As for more recent years the registered trend reflects, to a certain extent, the decoupling between emissions growth and economic activity. The decrease of carbon intensity (GHG emissions per GDP unit) perceived in the recent years (Figure 3) is in part related to the implementation of some important measures that had a positive effect in the emissions levels, such as:

- Introduction, in 1997, of natural gas (NG);
- Installation of combined cycle thermoelectric plants using NG (1999);
- Expansion of renewable energy in electricity production;
- Progressive installation of co-generation units;
- Enhancement of technology and energy efficiency of industrial processes;
- Improvement in car efficiency;
- Improvement of fuels quality.

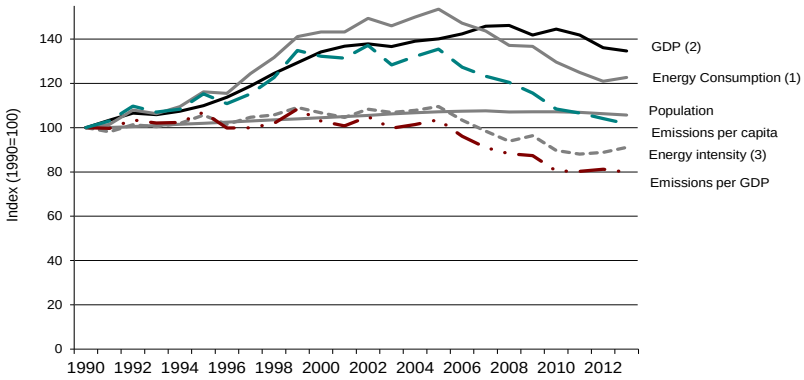

Figure 3: GHG emissions per capita, per unit of Gross Domestic Product (GDP) and energy consumption[13]

Sources: INE, DGEG.

Another fact that should be noted is the adoption of high-performance catalysts and optimization of the ratio ammonia/ air in the production of nitric acid which had an influence in the decrease of emissions.

The trend of the latest years reflects also the economic recession which affected Portugal and that accompanied some decline of industrial activity and consequently reduction in fuel consumption, associated with the closing of some industrial activities.

This trend was also verified in the final energy consumption (-2.7%) in 2013, while the growth in that year of the primary energy consumption(1%), resulting from the increase inactivity in the energy sector associated with the refining plants and petrochemical sector.

The level of emissions shows significant inter-annual variations, which are mostly occurring in the power sector and are related to the pronounced fluctuations of hydroelectric power generation (HPG) that is highly affected by annual variations in precipitation (Figure 4).

The national emissions decreased from 2012 to 2013 approximately 3%[14] (Table). This results from a decrease in the category "energy industries" and is related to a cutback of the use of coal (-9%) and NG (-70%) in thermal energy production, which is explained by an increase in HPG in 2013 due to a very favourable year in terms of water availability[15]. Lately, the domestic energy production has been growing as a result of a meaningful input from the RES, such as the hydro and wind power (Figure 5). In 2013, the domestic production of energy rose 17% compared to 2012, with an increase in HPG and wind of 123% and 17%, respectively.

[13]**Note**: (1) Primary Energy Consumption; (2) GDP at 2011 prices; (3) Energy Consumption per GDP.

[14]~2 Mt CO2eq.

[15] high index hydro (HPI = 1.17).

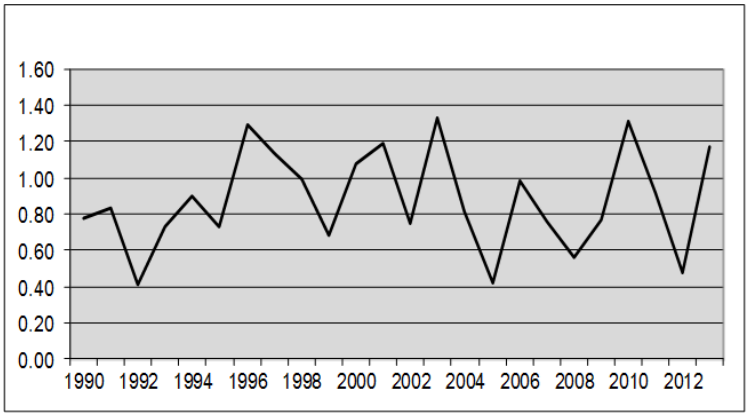

Figure 4: Hydraulic index16
Source: EDP, REN

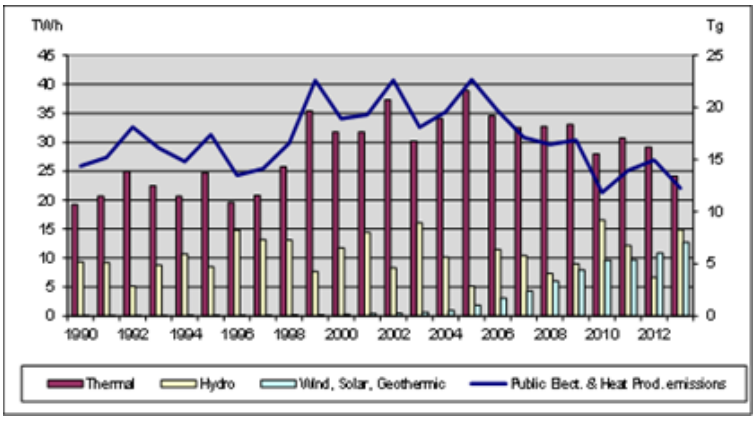

Figure 5: Gross electric power production and emissions from electricity and heat generation
Source: DGGE

An analysis of the different energy sources consumption (Figure 6) shows that in 2013 Oil remains as the main primary energy supply (44%), followed by RES (25%) and NG (17%). Nevertheless the weight of Oil has declined in the latest years (58% in 2004 vs. 45% in 2013), whereas the importance of RES (14% in 2004 vs. 24% in 2013) and NG (14% in 2004 vs. 17% in 2013) increased considerably.

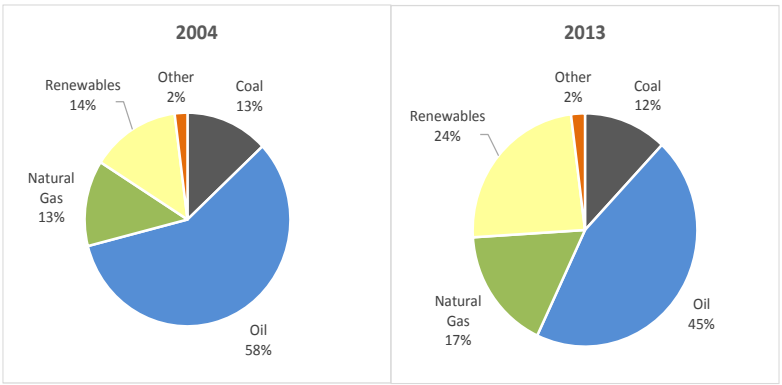

Figure 6:Primary energy consumption by energy source
Source: DGGE

[16]**Note**: HI = 1 corresponds to the average hydrologic availability.

i. Emissions trends by gases

Figure 7 shows the relative contribution of direct GHG to the total emissions for 1990 and 2013, being evident that $CO_2$is the main GHG[17] (73%), followed by CH_4 (19%) and N_2O (5%). Portugal has chosen 1995 as the base year for fluorinated gases and in 2013 these gases represented about 3% of total GHG emissions. NF_3 emissions are non-occurring in Portugal.

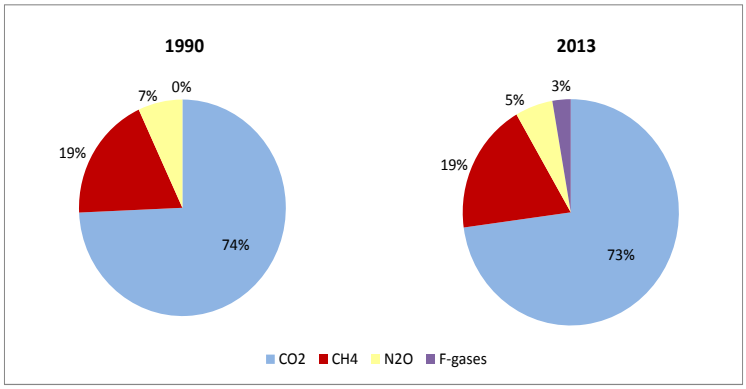

Figure 7: GHG emissions by gas

Over the 1990-2013 period (Figure 8), CH_4 gas registered the biggest increase (8%) andN_2O decreased by about 13%.

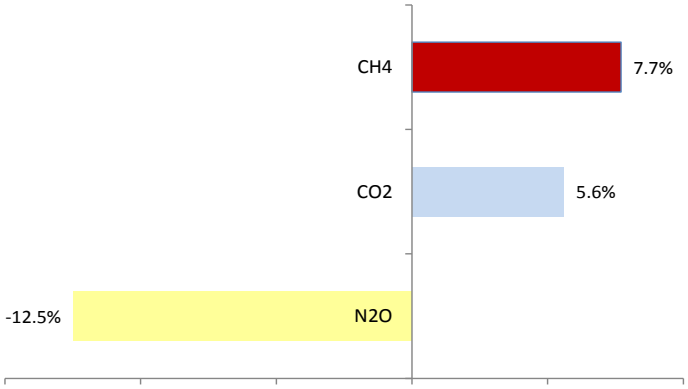

Figure 8: Change of GHG emissions by gas over the period 1990-2013

[17]On a carbon equivalent basis in 2013 (LULUCF excluded).

Table I: GHG emissions and removals in Portugal

GHG's Emissions	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO2 equivalent (Gg)											
CO2 emissions without net CO2 from LULUCF	44,896.42	46,537.77	50,767.20	49,432.14	50,090.68	54,105.06	51,478.46	54,317.10	58,833.38	66,530.60	65,355.02	65,061.56
CO2 emissions with net CO2 from LULUCF	45,933.37	47,527.30	47,153.11	44,687.68	44,614.51	48,846.96	42,510.92	44,443.63	51,113.57	57,772.06	58,741.25	55,092.08
CO2 emissions without net CH4 from LULUCF	11,339.18	11,594.39	11,784.81	11,812.75	12,248.47	12,602.33	12,567.44	12,763.17	13,210.37	13,425.70	13,290.73	13,561.55
CO2 emissions with net CO2 from LULUCF	11,544.25	11,870.86	11,872.89	11,888.00	12,368.75	12,858.73	12,664.45	12,802.35	13,415.42	13,532.32	13,475.69	13,672.42
CO2 emissions without net N2O from LULUCF	4,190.03	4,160.87	4,141.59	4,127.97	4,179.03	4,369.04	4,597.95	4,602.55	4,581.71	4,673.11	4,649.02	4,486.76
CO2 emissions with net N2O from LULUCF	4,730.84	4,694.47	4,625.41	4,590.78	4,637.08	4,846.46	5,046.31	5,038.50	5,041.91	5,113.22	5,098.03	4,919.67
HFCs	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	IE, NE, NO	30.65	48.91	71.47	100.63	185.93	288.45	374.38
PFCs	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO
Unspecified mix HFCs and PFCs	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO
SF6	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	14.62	15.12	16.87	17.38	18.39	18.43	20.29
NF3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (without LULUCF)	**60,425.62**	**62,292.03**	**66,693.60**	**65,372.87**	**66,518.18**	**71,121.70**	**68,707.88**	**71,771.17**	**76,743.46**	**84,833.72**	**83,601.66**	**83,504.54**
Total (with LULUCF)	**62,208.46**	**64,092.63**	**63,651.41**	**61,166.46**	**61,620.34**	**66,597.41**	**60,285.71**	**62,372.83**	**69,688.91**	**76,621.92**	**77,621.85**	**74,078.86**
Total (without LULUCF, with indirect)	**60,723.71**	**62,587.02**	**66,991.11**	**65,661.94**	**66,816.73**	**71,415.50**	**69,012.93**	**72,089.90**	**77,063.15**	**85,159.22**	**83,931.81**	**83,801.47**
Total (with LULUCF, with indirect)	**62,506.55**	**64,387.62**	**63,948.92**	**61,455.53**	**61,918.89**	**66,891.21**	**60,590.76**	**62,691.55**	**70,008.60**	**76,947.42**	**77,952.00**	**74,375.78**

GHG's Emissions	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	*% Change 1990-2013*
	CO2 equivalent (Gg)												
CO2 emissions without net CO2 from LULUCF	68,805.94	63,647.02	66,291.22	68,816.33	64,250.55	61,565.95	59,486.09	56,724.15	52,204.49	50,918.55	49,146.43	47.408.47	*5.60*
CO2 emissions with net CO2 from LULUCF	59,254.32	63,980.73	57,625.09	68,123.89	54,645.75	48,472.39	44,988.89	42,340.50	40,297.89	36,819.54	38,448.79	37,499.68	*-18.36*
CO2 emissions without net CH4 from LULUCF	13,811.33	14,021.90	13,991.63	13,997.14	13,517.76	13,342.75	13,129.70	13,077.00	12,770.64	12,823.40	12,476.64	12,212.58	*7.70*
CO2 emissions with net CO2 from LULUCF	13,983.21	14,739.22	14,130.31	14,555.01	13,620.54	13,384.39	13,150.86	13,134.07	12,922.34	12,884.25	12,650.92	12,366.12	*7.12*
CO2 emissions without net N2O from LULUCF	4,532.16	4,195.88	4,356.67	4,207.85	4,066.67	4,255.27	4,133.69	3,803.64	3,803.55	3,541.60	3,542.77	3,667.32	*-12.47*
CO2 emissions with net N2O from LULUCF	4,971.13	4,720.31	4,782.33	4,690.06	4,462.14	4,619.93	4,474.20	4,150.85	4,167.08	3,890.86	3,911.24	4,033.01	*-14.75*
HFCs	484.32	618.25	733.36	841.36	954.98	1,105.22	1,266.58	1,380.44	1,508.23	1,612.00	1,737.40	1,727.82	-
PFCs	NE, NO	NE, NO	NE, NO	0.00	0.13	0.01	0.01	0.01	0.01	0.01	0.01	0.01	-
Unspecified mix HFCs and PFCs	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	NE, NO	-
SF6	19.84	26.18	35.21	35.50	37.09	45.75	44.52	49.57	52.08	48.58	52.68	55.25	-
NF3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
Total (without LULUCF)	**87,653.59**	**82,509.23**	**85,408.08**	**87,898.18**	**82,827.19**	**80,314.94**	**78,060.58**	**75,034.82**	**70,338.99**	**68,944.15**	**66,955.92**	**65,071.46**	***7.69***
Total (with LULUCF)	**78,712.82**	**84,084.69**	**77,306.30**	**88,245.81**	**73,720.64**	**67,627.68**	**63,925.06**	**61,055.44**	**58,947.63**	**55,255.25**	**56,801.04**	**55,681.89**	***-10.49***
Total (without LULUCF, with indirect)	**87,936.94**	**82,785.94**	**85,683.65**	**88,167.23**	**83,097.00**	**80,588.05**	**78,323.51**	**75,275.70**	**70,588.68**	**69,182.53**	**67,188.85**	**65,307.62**	***7.55***
Total (with LULUCF, with indirect)	**78,996.18**	**84,361.41**	**77,581.86**	**88,514.87**	**73,990.45**	**67,900.80**	**64,187.99**	**61,296.33**	**59,197.31**	**55,493.63**	**57,033.97**	**55,918.05**	***-10.54***

NA- Not applicable; NE – Not estimated; NO – Not occurring.

ii. Emissions trends by main sources and sinks categories

The Energy is by far the most important of all sectors, accounting for 68% of total emissions in 2013, and presenting an increase of 8% over the 1990-2013 period. Energy industries and Transport are the two most important sources representing, respectively, around 23% and 24% of total emissions (Figure 9 and Figure 10). Within the Energy industries, public electricity and Heat production represents 19% of the total emissions. This reflects the country's dependency on fossil fuels for electricity generation and transportation, which have grown steadily until the mid-2000's due to a continuous increase of electricity demand driven in particular by the residential/commercial sector and the growth of mobility.

Concerning the mobility of people and goods, largely dominated by road traffic, is one of the sectors that have risen faster. In the period 1990-2013, the emissions of Transport increased by 54%, due to the steady growth of vehicle fleets (in particular with more powerful engines) and road travel from 1990 to the early 2000s, which reflects an increase of the families' income and a strong investment in the Portuguese road's infrastructures(decades of 1990s and 2000s). Indirectly, the increase in road traffic activity also augments the emissions from fossil fuel storage, handling and distribution. As previously assumed, the situation seems to have stabilized in the early 2000s and started to decline from 2005 onwards.

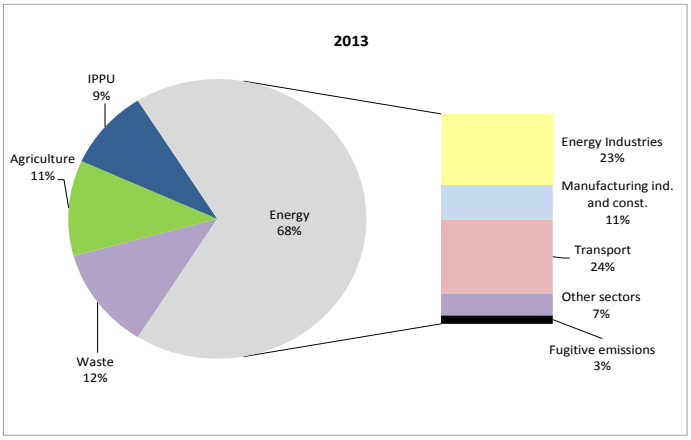

Figure 9: GHG emissions in Portugal by sector (2013)

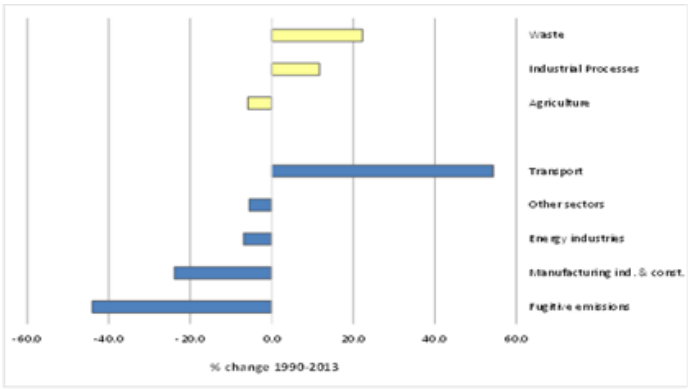

Figure 10: GHGs emissions percentage change (1990-2013) by IPCC category (LULUCF excluded)

Still within the Energy sector, the category Other sectors[18] registered a significant increase of the emissions in the 1990-2005 period (with almost 55% rise).

In the same time period, Agriculture was another significant source of GHG emissions and was responsible for 11% of the Portuguese emissions in 2013, which corresponds to a decrease of 6% since 1990. This fact is related with the decline of relevance of this sector in the national economy, reducing of the livestock number (e.g. swine), investment in extensive livestock production systems and a decrease of fertilizer consumption, related to a conversion process of arable crops to pastures.

Regarding Waste, this sector represented approximately 12% of the Portuguese emissions in 2013, recording an increase of approximately 22% since 1990. This is mainly related to the increase in waste generation (related with development of the family income and the urbanization growth registered in the country during the last decade) and the deposition of waste in landfills.

The Industrial processes represented 9% of the Portuguese emissions in 2013 and have grown 12% since 1990. These emissions, which are generated as by-product of many non-energy-related activities, are mostly related to the increase of cement production, road paving, limestone and dolomite use, lime production, glass and ammonia production.

The estimative of emissions and sinks from LULUCF category (Figure 11 and Table) show that this category has changed from being a net emitter in 1990 (1.8 Mt CO_2eq) to a carbon sink in 1992. This condition was again reverted in the years 2003 and 2005 due to the severe forest wildfires events registered in these years. In 2013 this sector represents a sequester of -9.4 Mt CO_2eq.

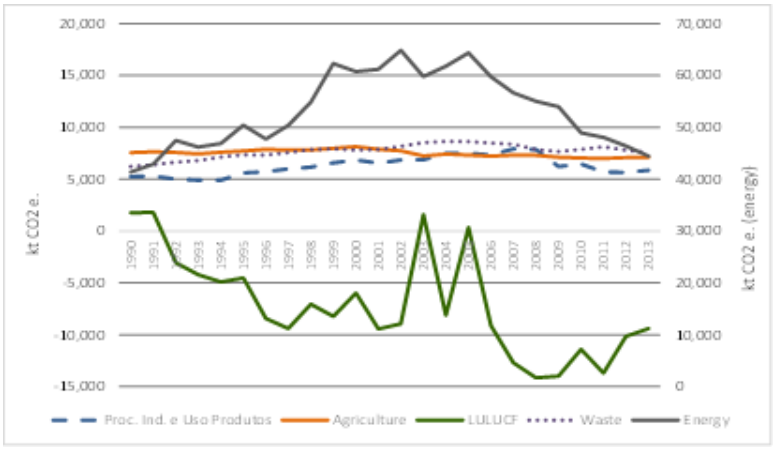

Figure 11: GHG emissions and removals by sector

[18] This category includes the residential and commercial activities.

Table II: GHG emissions and removals by sector

GHG's SOURCE AND SINK CATEGORIES	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	CO2 equivalent (Gg)											
1. Energy	41,388	42926.617	47,468	46,213	46,871	50,409	47,753	50,381	54,873	62,326	60,770	61,194
2. Industrial process and product use	5,246	5310.00357	5,009	4,912	4,906	5,616	5,737	6,009	6,176	6,583	6,861	6,544
3. Agriculture	7,573	7652.3079	7,580	7,442	7,606	7,734	7,888	7,801	7,831	7,993	8,144	7,894
4. Land use, land use change and forestry	1,783	1800.5981	-3,042	-4,206	-4,898	-4,524	-8,422	-9,398	-7,055	-8,212	-5,980	-9,426
5. Waste	6,218	6403.0718	6,637	6,806	7,135	7,363	7,330	7,580	7,864	7,932	7,826	7,872
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

GHG's SOURCE AND SINK CATEGORIES	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	*% Change 1990-2013*
	CO2 equivalent (Gg)												
1. Energy	64875.35	59825.67	61808.24	64396.11	56677.89	55040.97	55040.97	53987.86	48936.23	48075.74	46426.27	44473.76	*7.5*
2. Industrial process and product use	6856.97	6889.53	7506.62	7526.80	7332.13	7929.42	7869.03	62222.34	6466.69	5712.97	5656.36	5862.26	*11.7*
3. Agriculture	7746.19	7256.51	7436.92	7335.53	7232.15	7325.25	7303.42	7139.72	7058.06	7017.07	7081.92	7132.85	*-5.8*
4. Land use, land use change and forestry	-8940.76	1575.47	-8101.78	347,63	-9106.55	-12687.26	-14135.53	-13979.37	-11391.37	-13688.90	-10154.88	-9389.57	*-626.7*
5. Waste	8175.08	8537.52	8656.34	8639.73	8497.90	8382.38	7847.16	7684.90	7878.01	8138.36	7791.37	7602.59	*22.3*
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	*NO*

NA- Not applicable; NE – Not estimated; NO – Not occurring.

V. QUANTIFIED ECONOMY-WIDE EMISSION REDUCTION TARGET

In 2010, the EU submitted a pledge to reduce its GHG emissions by 2020 by 20% compared to 1990 levels, in order to contribute to achieving the ultimate objective of the UNFCCC: 'to stabilise GHG concentrations at a level that would prevent dangerous anthropogenic (human-induced) interference with the climate system'[19], or, in other words, to limit the global temperature increase to less than 2°C compared to temperature levels before industrialization (FCCC/CP/2010/7/Add.1). The EU is also committed to raising this target to a 30% emission reduction by 2020 compared with 1990 levels, provided that other developed countries also commit to achieving comparable emission reductions, and that developing countries contribute adequately, according to their responsibilities and respective capabilities. This offer was reiterated in the submission to the UNFCCC by the EU-28 and Iceland on 30 April 2014[20]. Portugal as part of the EU-28, takes on a quantified economy-wide emission reduction target jointly with all Member States.

The definition of the Convention target for 2020 is documented in the revised note provided by the UNFCCC Secretariat on the 'Compilation of economy-wide emission reduction targets to be implemented by Parties included in Annex I to the Convention' (FCCC/SB/2011/INF.1/Rev.1 of 7 June 2011). In addition, the EU provided additional information relating to its quantified economy-wide emission reduction target in a submission as part of the process of clarifying the developed country Parties' targets in 2012 (FCCC/AWGLCA/2012/MISC.1).

The EU clarified that the accounting rules for the target under the UNFCCC are more ambitious than the current rules under the Kyoto Protocol, for example, including international aviation, adding an annual compliance cycle for emissions under the Effort Sharing Decision or higher Clean Development Mechanism (CDM) quality standards under the EU Emissions Trading System (EU ETS) (FCCC/TP/2013/7). Accordingly, the following assumptions and conditions apply to the EU's 20% target under the UNFCCC (Table):

1. The EU Convention pledge does not include emissions/removals from Land Use, Land-Use Change and Forestry, but it is estimated to be a net sink over the relevant period. EU inventories also include information on emissions and removals from LULUCF in accordance with relevant reporting commitments under the UNFCCC. Accounting for LULUCF activities only takes place under the Kyoto Protocol.
2. The target covers the gases CO_2, CH_4, N_2O, HFCs, PFCs and SF_6.
3. The target refers to 1990 as a single base year for all covered gases and all Member States.
4. Emissions from international aviation to the extent it is included in the EU ETS are included in the target[21].
5. A limited number of CERs, ERUs and units from new market-based mechanisms may be used to achieve the target: in the ETS, the use of international credits is capped (up to 50% of the reduction required from EU ETS sectors by 2020). Quality standards also apply to the use of international credits in the EU ETS, including a ban on credits from LULUCF projects and certain industrial gas projects. In the ESD sectors, the annual use of international credits is limited to up to 3% of each Member State's ESD emissions in 2005, with a limited number of Member States (Portugal included) being permitted to use an additional 1% from projects in Least Developed Countries (LDCs) or Small Island Developing States (SIDS), subject to conditions.

[19] First steps to a safer future: Introducing the United Nations Framework Convention on Climate Change http://unfccc.int/essential/_background/convention/items/6036.php

[20] European Union, its Member States and Iceland submission pursuant to par 9 of decision 1/CMP.8' http://ec.europa.eu/clima/policies/international/negotiations/docs/eu_submission_20140430_en.pdf

[21] In the EU, the sum of emissions covered by category 1.A.3.a 'domestic aviation' and memo item 'international bunkers - aviation' go beyond the scope of the EU target, as emissions from international aviation are included in the EU Climate and Energy Package and the EU target under the UNFCCC to the extent to which aviation is part of the EU ETS.

6. The Global Warming Potentials (GWPs) used to aggregate GHG emissions up to 2020 under EU legislation were those based on the Second Assessment Report of the IPCC when the target was submitted. In its submission to clarify the 2020 target from 20 March 2012, the EU announced that the implications of the CMP Decision to revise the GWPs to those from the IPCC Fourth Assessment Report (AR4) are under review. This review has been completed and revised GWPs from AR4 were adopted for the EU ETS. For the revision of ESD targets the revised GWPs were taken into account. For the implementation until 2020, GWPs from AR4 will be used consistently with the UNFCCC reporting guidelines for GHG inventories.

Table III: Key facts of the Convention target of the EU-28

Parameters	Target
Base Year	1990
Target Year	2020
Emission Reduction target	-20% in 2020 compared to 1990
Gases covered	CO_2, CH_4, N_2O, HFCs, PFCs, SF_6
Global Warming Potential	AR4
Sectors Covered	All IPCC sources and sectors, as measured by the full annual inventory and international aviation to the extent it is included in the EU ETS.
Land Use, Land-Use Change, and Forests (LULUCF)	Accounted under KP, reported in EU inventories under the Convention. Assumed to produce net removals
Use of international credits (JI and CDM)	Possible subject to quantitative and qualitative limits.
Other	Conditional offer to move to a 30% reduction by 2020 compared to 1990 levels as part of a global and comprehensive agreement for the period beyond 2012, provided that other developed countries commit themselves to comparable emission reductions and that developing countries contribute adequately according to their responsibilities and respective capabilities.

The EU target is enshrined in legislation, and is being implemented by the EU and its Member States. At the heart of this legislation, the EU Climate and Energy package sets for the Union a 20% GHG emission reduction target by 2020 compared to 1990, which is equivalent to -14% compared to 2005. This effort has been divided between the sectors covered by the EU Emission Trading System (EU ETS) and non-ETS sectors under the Effort Sharing Decision (ESD).

This 14 % reduction objective is divided between the ETS and ESD sectors. These two sub-targets are:

- a 21 % reduction target compared to 2005 for emissions covered by the ETS (including domestic and international aviation);
- a 10 % reduction target compared to 2005 for ESD sectors, shared between the 28 Member States (MS) through individual national GHG targets.

While the EU ETS target is to be achieved by the EU as a whole, the ESD target was divided into national targets to be achieved individually by each Member State. Thus, under the framework of the EU effort-sharing to reduce GHG emissions among Member States (MS), Portugal took up the objective of limiting its emissions' growth to +1% by 2020 (compared to 2005) for the non-ETS sectors. These changes have been transferred into binding quantified annual reduction targets for the period from 2013 to 2020 (Commission Decisions 2013/162/EU and 2013/634/EU), denominated in Annual Emission Allocations (AEAs).

The quantified annual reduction targets 2013-2020 of Portugal are set at49.3 Million AEAs in 2013, increasing to 51.2Million AEAs in 2020. In the year 2013 verified emission of stationary installations covered under the EU-ETS in Portugal summed up to 24.6 Mt CO2 equivalent. With total GHG emissions of 65.1 Mt CO2 equivalent (without LULUCF) the share of ETS emissions is around 38%.

The target levels have been set on the basis of Member States' relative Gross Domestic Product per capita. In addition, different levels of development in the EU-28 are taken into account by the provision of several flexibility options. Up to certain limitations, the ESD allows Member States to make use of flexibility provisions for meeting their annual targets: carry-over of over-achievements to subsequent years within each Member State, transfers of AEAs between Member States and the use of international credits (credits from Joint Implementation and the Clean Development Mechanism). Nevertheless ESD targets are designed in a strict manner: Every year, once MS emissions are reviewed according to strict criteria (described in Chapter III of the Commission Implementing Regulation 749/2014), the European Commission issues an implementing decision on MS ESD emissions in the given year. MS exceeding their annual AEA, even after taking into account the flexibility provisions and the use of JI/CDM credits, will face inter alia a penalty – a deduction from their emission allocation of the following year (excess emissions, multiplied by 1.08).

Under the framework of the 2020 climate and energy package Portugal also adopted a target to increase RES in the final energy consumption by 31%, 10% of which in the transport sector. Portugal also adopted an overall national target of 25% increase in energy efficiency (EE) and a specific national EE target of 30% for the Public Administration.

Under the revised EU ETS Directive (Directive 2009/29/EC), a single ETS cap covers the EU Member States and three participating non-EU countries (Norway, Iceland and Liechtenstein), i.e. there are no further individual caps by country. Allowances allocated in the EU ETS from 2013 to 2020 decrease by 1.74 % annually, starting from the average level of allowances issued by Member States for the second trading period (2008–2012).

For the monitoring of GHG emissions at the EU and the Member State level, the Monitoring Mechanism Regulation No 525/2013 (MMR) was adopted in May 2013 and entered into force on 8 July 2013. The main aims of the MMR are to improve the quality of the data reported and assist the EU and Member States with the tracking of their progress towards emission targets for 2013-2020. The mechanism refers to the following reporting elements:

- Reporting on historical GHG emissions and removals, including national and Union inventory systems and approximated inventories;
- Reporting on low-carbon development strategies;
- Reporting on policies and measures and on projections of GHG emissions and removals
- Member States reporting on financial and technology support provided to developing countries;
- Member States' use of revenues from the auctioning of allowances in the EU Emissions Trading System (EU ETS);
- Member States' reporting on adaptation to climate change.

In 2014 the Implementing Regulation (EU No 749/2014) and Delegated Regulation (EU No 666/2014) were adopted to enable the implementation of the Monitoring Mechanism Regulation in several of its provisions, specifying in more detail the structure of the information, reporting formats, and submission procedures.

The reform of the EU Emission Trading System in Phase III (2013-2020) has resulted in important changes with regard to domestic institutional arrangements for the monitoring and reporting of GHG emissions under the EU ETS. EU ETS MRV now requires complying with two Commission Regulations, one specific to monitoring and reporting (EU No 601/2012) and the other to verification and accreditation (EU No

600/2012). The latter introduces a framework of rules for the accreditation of verifiers to ensure that the verification of an installation's or an aircraft operator's emission report is carried out by a verifier that possesses the technical competence to perform the entrusted task in an independent and impartial manner and in conformity with the requirements and principles set out. These regulations have direct legal effect in the Member States and their provisions apply directly to operators or aircraft operators, verifiers, and accreditation parties. The regulations provide clarity on the roles and responsibilities of all parties (i.e. industrial installations and aircraft operators are required to have an approved monitoring plan) which will strengthen the compliance chain.[22]

In general, in the EU the use of flexible mechanisms can take place on the one hand by operators in the EU ETS, on the other hand by governments for the achievement of ESD targets.

As part of phase II of the EU ETS (the period 2008-2012), Member States were required to inform the European Commission in their National Allocation Plans of the limit on JI and CDM credits that could be used by operators. This limit was then assessed according to the principle of supplementarity, and where appropriate approved or revised by the European Commission. In total, this adds up to approximately 1.4 billion CERs or ERUs that could have been used by operators for compliance in phase II of the EU ETS.

The amended EU ETS Directive 2009/29/EC (Article 11a (8)) sets the upper limit for credit use for the period from 2008 to 2020 at a maximum of 50 % of the reduction effort below 2005 levels. This is further specified into installation-level limits in the Commission Regulation on international credit entitlements (RICE) (EU No 1123/2013). The sum of the installation-level limits is expected to be lower than the upper limit, but higher than the 1.4 billion CERs and ERUs already allowed in the second period. Since some entitlements are expressed as a percentage of verified emissions over the entire period, the overall maximum amount will only be known at the end of the third trading period.

Since 2013 it is no longer possible to track the use of flexible mechanisms in the EU ETS directly via information on EUTL public website because CERs and ERUs are no longer surrendered directly but are exchanged into EUAs. These exchanges will become public on installation level after three years, with the first information reflecting the use in 2013 available in 2016.

The ESD allows Member States to make use of flexibility provisions for meeting their annual targets, with certain limitations. In the ESD sectors, the annual use of carbon credits is limited to up to 3 % of each Member State's ESD emissions in 2005. Member States that do not use their 3 % limit for the use of international credits in any specific year can transfer the unused part of their limit to another Member State or bank it for their own use until 2020. Member States fulfilling additional criteria, as is the case for Portugal, may use credits from projects in Least Developed Countries (LDCs) and Small Island Developing States (SIDS) up to an additional 1 % of their verified emissions in 2005. These credits are not bankable and transferable.

Moreover, higher CDM quality standards apply to the use of CERs for compliance with the EU's target under the Convention.

In addition to the EU target under the Convention, the EU also committed to a legally binding quantified emission limitation reduction commitment for the second commitment period of the Kyoto Protocol (2013 - 2020).

In Table all relevant GHG reduction targets for the EU and their key facts are displayed in an overview. On the left, the table includes the international commitments under the Kyoto Protocol and the UNFCCC. On the right, the EU commitments under the Climate and Energy Package are included.

[22] http://ec.europa.eu/clima/policies/ets/monitoring/documentation_en.htm

Table IV: Overview on EU targets

	International commitments			EU domestic legislation	
	Kyoto Protocol		UNFCCC	Climate and Energy Package	
				EU ETS	ESD
Target year of period	First commitment period (2008-2012)	Second commitment period (2013-2020)	2020	2013-2020	2013-2020
Emission reduction target	-8%	-20%	-20%	-21% compared to 2005 for ETS emissions	Annual targets by MS. In 2020 -10% compared to 2005 for non-ETS emissions
Further targets			Conditional target of -30% if other Parties take on adequate commitments	Renewable Energy Directive: 20% share of renewable energy of gross final energy consumption; Energy Efficiency Directive : Increase energy efficiency by 20 %	
Base year	1990 KP Flexibility rules (Art 3(5)) regarding F-gases and Economies in Transition	1990, but subject to flexibility rules. 1995 or 2000 may be used as its base year for NF3	1990	1990 for overall emission reduction target; 2005 for renewable energy and energy efficiency target; as well as for targets broken down into ETS and non-ETS emissions	
LULUCF	Included ARD and other activities if elected	Included ARD and forest management, other activities if elected (new accounting rules)	Excluded	Excluded	
Aviation	Domestic aviation included. International aviation excluded.	Domestic aviation included. International aviation excluded.	Aviation in the scope of the EU ETS included. In practice total aviation emissions considered.	Domestic and international aviation, as in the scope of EU ETS	Aviation generally excluded, some domestic aviation included (operators below ETS de minimis thresholds)
Use of international credits	Use of KP flexible mechanisms subject to KP rules	Use of KP flexible mechanisms subject to KP rules	Subject to quantitative and qualitative limits	Subject to quantitative and qualitative limits	Subject to quantitative and qualitative limits
Carry-over of units from preceding periods	Not applicable	Subject to KP rules including those agreed in the Doha Amendment	Not applicable	EU ETS allowances can be banked into subsequent ETS trading periods since the second trading period	No carry-over from previous period
Gases covered	CO2, CH4, N2O, HFCs, PFCs, SF6,	CO2, CH4, N2O, HFCs, PFCs, SF6, NF3	CO2, CH4, N2O, HFCs, PFCs, SF6	CO2, CH4, N2O, HFCs, PFCs, SF6	
Sectors included	Annex A of KP (Energy, IPPU, agriculture, waste), LULUCF according to KP accounting rules for CP1	Annex A of KP (Energy, IPPU, agriculture, waste), LULUCF according to accounting rules for CP2	Energy, IPPU, agriculture, waste, aviation in the scope of the EU ETS	Power & heat generation, energy-intensive industry sectors, aviation (Annex 1 of ETS directive)	Transport (except aviation), buildings, non-ETS industry, agriculture (except forestry) and waste
GWPs used	IPCC SAR	IPCC AR4	IPCC AR4	IPCC AR4	

VI. PROGRESS IN ACHIEVEMENT OF QUANTIFIED ECONOMY-WIDE EMISSION REDUCTION TARGETS AND RELEVANT INFORMATION

This chapter provides an overview on Portugal's policies and measures (PaMs) which contribute to meeting its emission reduction target.

Two distinct levels of PaMs that have an impact on greenhouse gas emissions need to be considered:

- European Union policies, which are proposed by the Commission and subsequently approved, amended or rejected by the Council of the European Union and the European Parliament. These common and coordinated policies and measures are applicable to all Member States, though Member States may implement Directives at different points in time. This report concentrates on these EU policies.
- National policies developed and implemented by Portugal.

A. MITIGATION ACTIONS AND THEIR EFFECTS

1. Strategic Framework for Climate Policy

Portugal has successfully concluded a climate policy cycle on mitigation and adaptation in the period up to 2013, that allowed achieving both the fulfilment of the national objectives as regards climate change under the Kyoto Protocol framework as well as the remaining sectoral challenges in what vulnerabilities are concerned.

In 2015, the political and institutional response in this regard was updated and further developed establishing an integrated framework of policy instruments in the 2020/2030 timeframe: the Strategic Framework for Climate Policy (QEPiC). It includes the main national policy instruments in the areas of climate change mitigation and adaptation: the National Programme for Climate Change 2020/2030 (PNAC) and the National Strategy for Adaptation to Climate Change 2020 (ENAAC).

The QEPiC – which constitutes a climate policy innovation in Portugal by integrating, for the first time, all the dimensions of climate change and all the instruments – provides the national response to the commitments made for 2020 (under the UNFCCC and the 2020 Climate and Energy Package) and put forward for 2030 in the framework of the European Union (and under the Paris Agreement) and integrates the relevant national targets established under the Green Growth Commitment (CCV).

The vision of QEPiC is the development of a competitive, resilient and low carbon economy, setting a new development paradigm for Portugal in the context of Green Growth., which relies on the following nine objectives:

1. Promote the transition to a low carbon economy, generating more wealth and employment, contributing to green growth;
2. Ensure a sustainable greenhouse gases (GHG) emissions' reduction trajectory;
3. Strengthen the resilience and the national capacity for adaptation;
4. Ensure an engaged participation in the international negotiations and cooperation;
5. Stimulate research, innovation and knowledge production;
6. Involve the society in climate change challenges, contributing to increase the individual and collective action;
7. Increase the efficiency of information management, reporting and monitoring systems;
8. Ensure funding conditions and increase the investment levels;
9. Ensure effective governance conditions and climate change mainstreaming.

The QEPiC also identifies its support mechanisms as regards financing, reporting and monitoring the implementation of climate policy and actions undertaken. It establishes a National System for Policies and Measures (SPeM) and a governance, monitoring and reporting structure for the ENAAC. The role of the National System for the Inventory of Emissions by Sources and Removals by Sinks of Air Pollutants (SNIERPA) is also reviewed and integrated into the QEPiC. The integration of these support mechanisms represents and articulated framework for the implementation and follow-up of the national climate policy, constituting the national reference for Monitoring, Reporting and Verification (MRV).

The coherent articulation of the different elements of climate policy so as to achieve the objectives set up at national and European level and under the Framework of the United Nations Convention for Climate Change (UNFCCC) requires the establishment of a strong, multi-layered governance system (Figure 12).

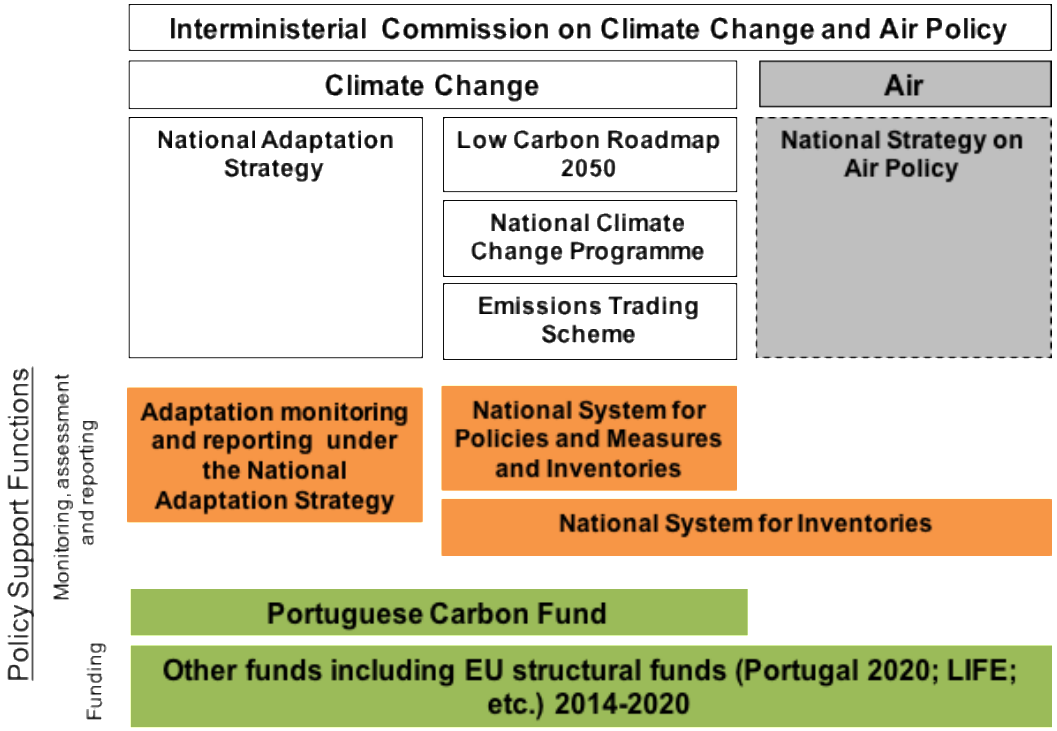

Figure 12: National climate policy architecture and articulation with national air policy

A close follow-up by the sectorial high level decision makers is crucial to achieve a greater integration and accountability of the sectors. For this reason a Ministerial Commission for Air and Climate Change (CIAAC) shall be set up, acknowledging the synergies between the topics of Air and Climate Change.

The following political documents should also be considered as national policy instruments:

- Green Growth Commitment (CCV);
- Green Fiscal Reform (RFV);
- National Action Plan for Energy Efficiency (PNAEE);
- National Action Plan for Renewables (PNAER);
- Strategic Plan for Urban Solid Waste (PERSU 2020);
- National Plan for Waste Management 2014-2020 (PNGR);
- New Strategy for Water Sector and Wastewater Sanitation (PENSAAR 2020);
- Programme for Rural Development 2014-2020 (PDR 2020);
- National Strategy for Forests (ENF);
- National Sea Strategy 2013-2020 (ENM 2013-2020);

- National Transport and Infrastructure Plan (PETi3+);
- Nacional Strategy for Sustainable Cities 2020;
- National Strategy for Smart Research and Innovation.

It should be underlined that the changes imposed by the Portuguese environmental tax reform (Law n.º 82-D/2014 of 31st of December[23])will contribute for eco-innovation and efficiency of the resources application, a reduction of energy dependency from abroad and to encourage a more sustainable production and consumption patterns, promote the entrepreneurship and job's generation, an efficient achievement of international goals and purposes plus a diversification of the revenue sources framed by a fiscal neutrality and economic competitiveness.

Concerning the Energy and Transports sectors, it should be underlined the following measures:

- The indexation of the Emissions Trading System (ETS)sectors carbon price's to the Non-ETS sectors taxation (Carbon Tax);
- Measures in order to promote the electric mobility;
- Increase of the tax burden over the vehicles(ISV) according to theirCO_2 emissions;
- Measures to promote the use of public transport;
- Promotion of incentives to scrap cars at the end of life.

It should be emphasized that the impacts of the Portuguese environmental tax reform were not considered in the political scenarios that support the reported projections because their political approval only happen after the end of the projection's works.

2. National Climate Change Programme 2020/2030

PNAC 2020/2030 is focused on climate change mitigation and covers all sectors of the national economy. It identifies the climate policy objectives, in line with the cost-effective emissions' reduction potential, to maintain a low carbon trajectory, consolidating the progress achieved in the past years.

Nowadays, climate change public policies are already part of a set of sectoral policies in Portugal. In fact, in areas such as energy and industry covered by the EU emissions trading system (ETS), the carbon dimension is one of the strategic and economic considerations of the companies. The ETS remains a fundamental instrument for climate change mitigation policy, both at national and European level.

As regards agriculture and forestry there is also a growing awareness of the important contribution these sectors can give in terms of GHG emissions mitigation. Even in areas with important challenges such as transports, important steps were given towards the decarbonisation of vehicle fleets, for example by renewing the fleets, converting urban public buses to natural gas and promoting the electric mobility by setting a pilot charging infrastructure network for electric vehicles (EV), creating incentives for the acquisition of EV and acquiring 30 EV for the Public Administration fleet.

The Green Taxation Reform is one of the drivers identified in the Commitment to Green Growth in order to stimulate innovation and sustainable growth, helping to reconcile protection of the environment with economic growth. The reform must also encourage the efficient use of resources, thereby preserving and harnessing natural capital and fostering fair and sustainable use of the soil, territory and urban areas while introducing signs which facilitate the transition to a low-carbon economy. Furthermore, it includes a carbon tax, indexed to the price of carbon permits in the EU ETS, incentives to electric vehicles and sustainable mobility.

[23] Lei n.º82-D/2014, de 31 de dezembro.

PNAC sets the guidelines, de sectoral emissions reduction targets and identifies a set of policies and measures to be developed together with the relevant policy sectors in areas such as transports, energy, agriculture and forestry. The PNAC therefore features a compilation of other policy instruments (being a "plan of plans") and becomes a dynamic reference framework for the identification and definition of sectoral policies and measures, based on their ex-ante and ex-post evaluation as regards the low carbon dimension.

PNAC 2020/2030 sets the following objectives:
a) Promote the low carbon transition, generating more wealth and employment and contributing to green growth;
b) Ensure a sustainable national GHG emissions reduction trajectory to achieve the target of -18% to -23% in 2020 and -30% to -40% in 2030 compared to 2005, thus fulfilling the national mitigation commitments and keeping Portugal in line with the European objectives;
c) Mainstream mitigation objectives into sectoral policies.

PNAC also contributes to other objectives of the QEPiC such as promoting research, innovation and knowledge production and the involvement of the society in climate change challenges, contributing to increasing individual and collective action, and provides guidelines for policies and measures to achieve the emissions reduction targets set. In particular, it puts forward sectoral emission reduction targets for the non-ETS sectors for 2020 and 2030.

To ensure the transition to a low carbon economy it is fundamental to align the objectives of climate and energy policies, in particular as regards the level of ambition for EE and RES penetration so as to collect the inherent benefits in terms of energy security, petroleum products trade balance and emissions reduction trajectory.

Climate and energy objectives are mutually reinforcing so the PNAC has incorporated sectoral policies and measures to achieve the energy policy objectives for 2030 needed in the CCV (30% reduction on the energy baseline and 40% of RES in the national energy consumption).

In this context a new support mechanism is established to follow-up on policies and measures and projections, to uphold the evaluation of progress in the implementation of sectoral mitigation policies and measures, promoting the engagement and reinforcing the accountability of the different policy sectors in order to mainstream climate policy.

The National System for Policies and Measures (SPeM) ensures the management of the process regarding the definition of policies and measures and the elaboration of projections and promotes the connection between the national inventory and the emissions' projections. Through the SPeM the sectors can identify the policies and measures to be implemented in the 2020/2030 timeframe in more detail.

Besides the traditional sectoral areas, the measures are organised into crosscutting areas (research, development and innovation; knowledge, information and awareness) and integrated intervention areas (public administration; sustainable cities) in accordance to their implementation.

It should be underlined that in the crosscutting areas there is both a reinforcement of participation, communication and awareness-raising of citizens, to promote a greater involvement of civil society as regards climate change as well as the consideration of specific measures regarding innovation and development, which are crucial elements for the transition to a low carbon economy.

The sustainable cities dimension seeks to highlight the relevant role of cities in tackling climate change and the wide variety of initiative taking place at local and regional level. The creation of an intervention area dedicated to the role of the State in the transition to a low carbon economy is justified by the relevance

of the public sector in the national economy and the impacts that the actions undertaken might have in the economy.

Policies and measures in place are reported in CTF Table 3 and as an Annex to this report.

3. Overarching policies and measures: ETS and ESD

The two main overarching policies are the EU Emission Trading System (ETS) and the Effort Sharing Decision (ESD), both establishing EU internal rules under the "2020 climate and energy package" which underpin the implementation of the target under the Convention.

i. EU Emissions Trading System

The following structural changes to the ETS have taken place or have been decided since the publication of the BR1.

Firstly, the scope of the ETS with regard to aviation has been changed. Since 2012 emissions from all flights from, to and within the European Economic Area (EEA) - the 28 EU Member States, plus Iceland, Liechtenstein and Norway - are included in the EU Emissions Trading System (ETS). The legislation, adopted in 2008, applies to both EU and non-EU airlines alike. To allow time for negotiations on a global market-based measure applying to international aviation emissions, the ETS requirements were suspended for flights in 2012 to and from non-European countries (Decision No 377/2013/EU). For the period 2013 to 2016 the legislation has also been amended so that only emissions from flights within the EEA fall under the ETS (Regulation EU No 421/2014). The EU made this change following agreement by the International Civil Aviation Organization (ICAO) Assembly in October 2013 to develop a global market-based mechanism addressing international aviation emissions by 2016 and apply it by 2020. The amended law provides for the Commission to report to the European Parliament and Council on the outcome of the 2016 ICAO Assembly and propose measures as appropriate to take international developments into account with effect from 2017. With Regulation EU No 421/2014 exemptions for operators with low emissions have also been introduced.

Since 2013, the EU ETS operates under the improved and harmonised rules of Phase 3. In October 2014 EU Heads of State and Government have decided- within the 2030 Climate and Energy Framework- that a well-functioning, reformed EU ETS together with an instrument to stabilise the market (Market Stability Reserve – MSR) will constitute the main mechanism to achieve the reduction of emissions in the EU ETS by 43% compared to 2005.

The MSR has adopted in October 2015 (Decision (EU) 2015/1814). The reserve will start operating in January 2019. It will neutralise the negative impacts of the existing surplus of allowances and improve the system's resilience to future shocks by adjusting the supply of allowances to be auctioned.

On 15 July 2015, the Commission presented a legislative proposal on the revision of the EU ETS for Phase 4 in line with the 2030 Climate and Energy policy Framework.

The key changes are:

- The overall number of emission allowances will decline at an annual rate of 2.2% from 2021 onwards, compared to 1.74% currently. This leads to a significant additional emissions reduction of some 556 million tonnes between 2021 and 2030.
- The proposal further develops predictable, robust and fair rules to address the risk of carbon leakage. The system of free allocation is revised in order to distribute the available allowances in the most effective and efficient way to those sectors at highest risk of relocating their production outside the EU (around 50 sectors in total).

- An Innovation Fund will be set up to extend existing support for the demonstration of innovative technologies to breakthrough innovation in industry. Free allowances will continue to be available to modernise the power sector in lower-income Member States. In addition, a dedicated Modernisation Fund will be established to facilitate investments in modernising the power sector and wider energy systems and boost energy efficiency in these Member States.

ii. Effort Sharing Decision

Since the publication of the BR1 the national ESD targets have been adjusted to reflect the change in scope of the EU ETS with Decision 2013/634/EU. The progress of Member States in meeting the emission reduction targets set in the ESD is assessed under the Monitoring Mechanism Regulation (Regulation No 525/2013), and also as part of the European Semester[24].

iii. Other Cross-cutting policies and measures

To respond to challenges and investment needs related to climate change, the EU has agreed that at least 20% of its budget for 2014-2020 – as much as €180 billion – should be spent on climate change-related action. To achieve this increase, mitigation and adaptation actions are integrated into all major EU spending programmes, in particular cohesion policy, regional development, energy, transport, research and innovation and the Common Agricultural Policy.

4. Assessment of the economic and social consequences of response measures

Portugal's contribution to the minimisation of the adverse effects of climate change in other Parties, particularly developing countries, is carried out through a strong commitment to implementing the Convention and the Kyoto Protocol.

As such, the policies and measures implemented, adopted or foreseen in PNAC, targeting the six GHG of the Kyoto Protocol through its broad portfolio of instruments and wide-ranging coverage of all sectors of the economy, make up a significant effort by the Portuguese Government to address climate change, including the minimization of adverse effects of such policies.

In some cases, such as measures pertaining to the diversification of primary energy sources (namely shifting to natural gas), there can simultaneously be positive effects on Portugal's emissions reduction and in the economy of some fossil fuel exporting countries.

To ensure that all relevant possible impacts are taken into account, the SPeM to be established will address to the extent possible information on the economic and social consequences of climate policy measures.

B. ESTIMATES OF EMISSION REDUCTIONS AND REMOVALS AND THE USE OF UNITS FROM THE MARKET-BASED MECHANISMS AND LAND USE CHANGE AND FORESTRY ACTIVITIES

After a rapid GHG emissions growth during the 90's, Portugal peaked its emissions in 2005 and since then a significant and sustained decrease of emissions has been registered, thus consolidating a decarbonisation trajectory of the national economy.

During the first commitment period under the Kyoto Protocol, and under the framework of the European Union effort-sharing, Portugal was bound to limit the increase of its emissions to no more than +27%,

[24] The European Semester is the EU's annual cycle of economic policy guidance and surveillance: http://ec.europa.eu/economy_finance/economic_governance/the_european_semester/index_en.htm

compared to 1990, in the period 2008-2012. The trajectory since 2005 allowed Portugal to fulfil its Kyoto commitment. All sectors, including the land use, land-use changes and forestry (LULUCF) contributed to this endeavour.

In complying with its KP1st commitment period commitment Portugal made use of LULUCF credits generated (RMU) and of flexible mechanisms (both CER and ERU). Use of RMU amounted to some 12,4% of Portugal's compliance. Use of CER and ERU use amounted to some 4% of Portugal's compliance.

The use of flexible mechanisms takes place on the one hand by operators in the EU ETS, on the other hand by governments for the achievement of ESD targets. For information on the use in the ETS please see the 2nd BR of the European Union.

The use of flexible mechanisms under the ESD cannot be quantified in the moment. As the compliance assessment for the first year 2013 under the ESD will only take place in 2016, any potential use of units for the first year will only take place in 2016. Thus, for the 2nd BR the EU and its MS can only report that no units have been used under the ESD so far. This is why no quantitative information can be given for the use of flexible mechanisms in BR2 in CTF Table 4b.

VII. PROJECTIONS

A. GENERAL INFORMATION

The PNAC sets guidelines, defines sectoral emissions reduction targets and identifies a set of policies and measures to be developed together with the relevant policy sectors in areas such as transports, energy, agriculture and forestry. The PNAC therefore features a compilation of other policy instruments (being a "plan of plans") and becomes a dynamic reference framework for the identification and definition of sectoral policies and measures, based on their ex-ante and ex-post evaluation as regards the low carbon dimension.

The PNAC 2020/2030 provides guidelines for policies and measures to achieve the emissions reduction targets set. In particular, it puts forward sectoral emission reduction targets for the non-ETS sectors for 2020 and 2030.

The reported projections are part of a task that began in 2013 and ended in 2014which were included in the production of the PNAC2020/2030. Preliminary results from the work undertaken were already reported in BR1. The reported projections should be considered in the timeframe of 2030 and their data are in compliance to the Global Warming Potentials (GWP) of the 4th Assessment Report (4AR).

In the context of TIMES_PT model, emissions that were not covered by this model, as for example fugitive emissions and fluorinated gases, were estimated based on the results obtained by the activity model, especially in the refining, distribution of petroleum products and natural gas sectors; and by the refrigeration level used in the various sectors. The results were subsequently added to the energy sector ones.

Table V: Historic greenhouse gas emissions and greenhouse gas emission projections in the 'with existing measures' scenario

	1990	1995	2000	2005	2010	2013	2015	2020	2025	2030
History										
kt CO^2 equivalent										
Total CO_2 equivalent emissions without land use, land-use change and forestry	60 425,62	71 121,70	83 601,66	87 898,18	70 338,99	65 071,46	-	-	-	-
Sector										
Energy (with transport)	41 388,39	50 408,78	60 770,16	64 396,11	48 936,23	44 473,76	-	-	-	-
Transport	10 019,67	13 336,96	18 968,44	19 400,62	18 538,48	15 464,65	-	-	-	-
Industrial Processes	5 246,32	5 615,82	6 861,40	7 526,80	6 466,69	5 862,26	-	-	-	-
Agriculture	7 573,37	7 733,85	8 143,63	7 335,53	7 058,06	7 132,85	-	-	-	-
LULUCF	1 782,84	-4 524,29	-5 979,80	347,63	-11 391,37	-9 389,57	-	-	-	-
Waste	6 217,55	7 363,24	7 826,46	8 639,73	7 878,01	7 602,59	-	-	-	-
By Gas										
CO_2 emissions without net CO_2 from LULUCF	44 896,42	54 105,06	65 355,02	68 816,33	52 204,49	47 408,47	-	-	-	-
CH_4 emissions without CH_4 from LULUCF	11 339,18	12 602,33	13 290,73	13 997,14	12 770,64	12 212,58	-	-	-	-
N_2O emissions without N_2O from LULUCF	4 190,03	4 369,04	4 649,02	4 207,85	3 803,55	3 667,32	-	-	-	-
Total F-Gases (excl.NF3)		45,27	306,88	876,86	1 560,32	1 783,08	-	-	-	-
Total (without LULUCF)	60 425,62	71 121,70	83 601,66	87 898,18	70 338,99	65 071,46	-	-	-	-
Memo items:										
Aviation	1 480,27	1 631,01	2 001,40	2 277,64	2 634,58	2 823,34	-	-	-	-
Navigation	1 400,07	1 118,90	1 667,10	1 553,20	1 634,59	2 210,24	-	-	-	-
With Existing Measures Scenario										
kt CO^2 equivalent										
Sector										
Total CO_2 equivalent emissions without land use, land-use change and forestry	-	-	-	-	-	-	70 514,07	63 048,57	58 749,41	55 847,11
Energy (with transport)	-	-	-	-	-	-	46 735,42	40 051,23	37 529,96	35 648,65
Transport	-	-	-	-	-	-	15 692,95	15 044,49	14 884,36	14 746,65
Industrial Processes	-	-	-	-	-	-	6 069,17	6 588,42	5 721,88	5 969,82
Agriculture	-	-	-	-	-	-	8 488,09	8 142,39	7 919,91	7 241,39
LULUCF	-	-	-	-	-	-	-9 999,85	-7 567,04	-7 941,77	-8 316,48
Waste	-	-	-	-	-	-	9 221,39	8 266,53	7 577,65	6 987,25
By Gas										
CO_2 emissions without net CO_2 from LULUCF	-	-	-	-	-	-	48 960,16	42 242,87	40 011,46	38 332,36
CH_4 emissions without CH_4 from LULUCF	-	-	-	-	-	-	14 360,57	13 202,54	12 337,64	11 132,49
N_2O emissions without N_2O from LULUCF	-	-	-	-	-	-	4 589,76	4 613,30	4 577,59	4 640,02
Total F-Gases (excl.NF3)	-	-	-	-	-	-	2 603,58	2 989,86	1 822,71	1 742,24
Total (without LULUCF)	-	-	-	-	-	-	70 514,07	63 048,57	58 749,41	55 847,11
Memo items:										
Aviation	-	-	-	-	-	-	NE	NE	NE	NE
Navigation	-	-	-	-	-	-	NE	NE	NE	NE

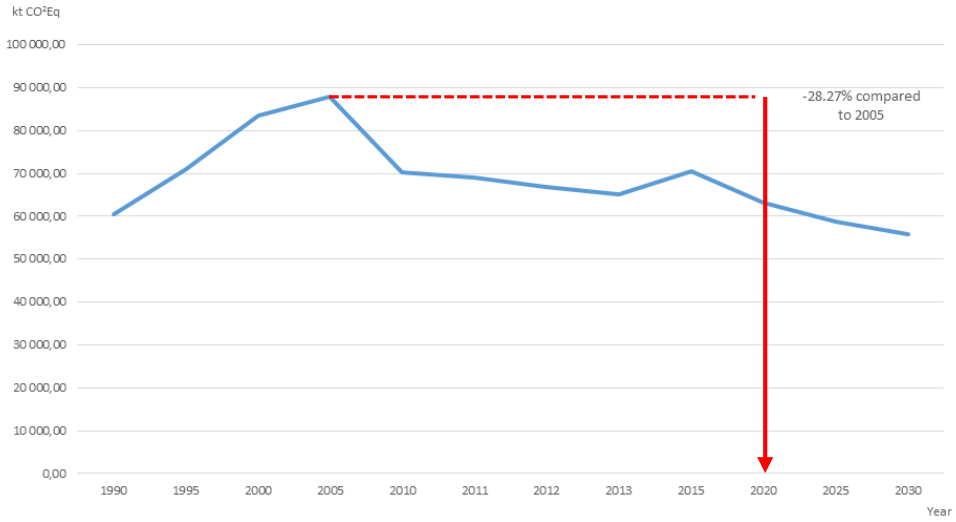

Figure 13: Total, aggregate, absolute historic and projected GHG emissions (Portugal)

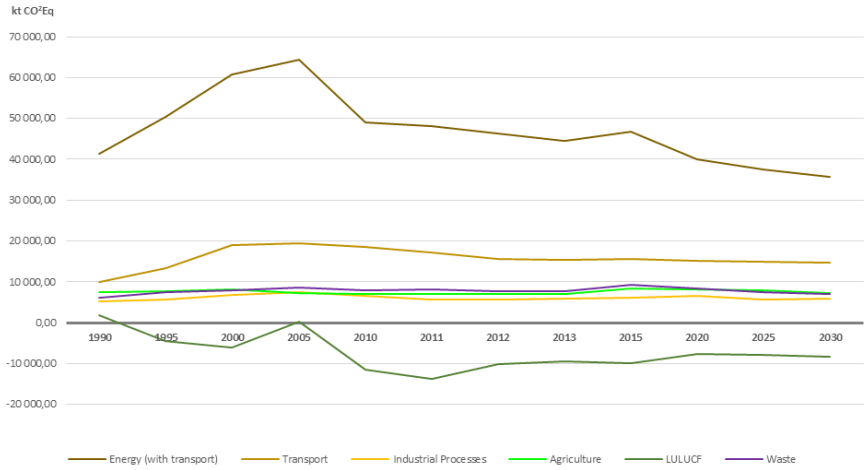

Figure 14: Portuguese GHG emissions per sector in the WEM scenario

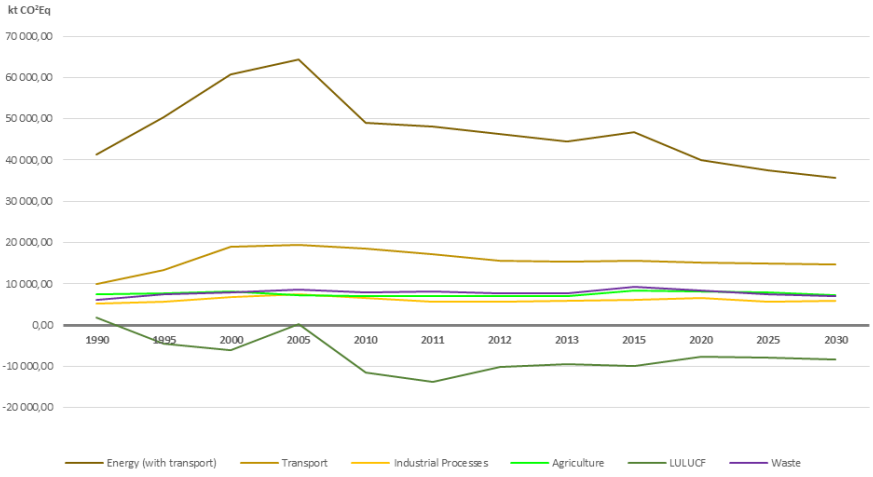

Figure 15: GHG emissions per gas in the WEM scenario (total excluding LULUCF)

B. PROJECTIONS METHODOLOGY

There are no changes from the methodology reported in BR1 including for waste and LULUCF sectors. Portugal uses the TIMES_PT, a technological model of linear optimization which results from the implementation of a generation of economy – energy – environment optimized models, with a TIMES[25] technology base, in Portugal.

The generic structure of TIMES can be adapted by each user to simulate a specific energy system, at local system national or multi-regional. TIMES_PT was initially developed under the European Project NEEDS, integrating a Pan European TIMES model used to estimate total European costs (including externalities) of energy production and consumption. The ultimate goal of any TIMES is to satisfy the demand for energy services at the minor cost. In order to do that, investment options and the operation of some technologies, as well as the primary energy sources and energy exportations and importations, according to the following equation:

$$NPV = \sum_{r=1}^{R} \sum_{y \in YEARS} (1 + d_{r,y})^{REFYR-y} \bullet ANNCOST(r, y)$$

NPV: actualizes net value of total costs;
ANNCOST: annual total cost;
d: actualization rate;
r: region;
y: years;
REFYR: reference year for the actualization;
YEARS: years in which costs exist (all costs for the modelling period + past years when costs where defined for past investments + the number of years after technology life time, in case there are decommissioning costs).

For each year, the TIMES models calculate the current sum of the total costs, expect the income. In the case of TIMES_PT model, the costs taken into account are the investment, operation and maintenance costs (fixed and variable) of the various production technologies and energy consumption. The Income usually considered in TIMES models include subsidies and materials recovery, which are not considered in the TIMES_PT model. More information about TIMES development and their equations can be obtained in [7] .

The TIMES_PT model represents the Portuguese energy system from 2000 to 2050, including the following sectors:

1. Primary energy supply (refining and synthetic fuels production, import and local resources);
2. Electricity production;
3. Industry (cement, glass, ceramics, steel, chemical, paper and pulp, lime and other industrials);
4. Residential;
5. Commercial and Services;
6. Agriculture , forestry and fisheries (only the energy consumption), and
7. Transport.

In each sector the monetary, energy and materials fluxes are modelled according to the various production technologies and energy consumption, including mass balances for some industry sectors.

The simplified structure of the TIMES_PT model is shown in figure X, as well as its main inputs and outputs.

[25] TIMES is an acronym for *The Integrated Markal-EFOM System*. BothMarkal-*MarketAllocation* andEFOM-*EnergyFlowOptimizationModel* are based technology energy models developed by the IEA in the 80's and 70's, respectively. This model was developed by ETSAP (*Energy Technology Systems Analysis Program*) of the International Energy Agency.

The implementation of TIMES_PT requires a set of exogenous inputs, namely:

1. Demand for energy services;
2. Technologies' technical and economic characteristics for the base year and the future (e.g. efficiency, input/output ratio, availability, investment, operation and maintenance costs and actualization rate);
3. Availability of primary energy sources in the present and in the future, especially the potential for the use of endogenous energy resources, and
4. Policy restrictions (e.g. energy production targets or reduction of emissions).

Based on these elements, it is possible to obtain from the TIMES_PT model a series of outputs, such as:

1. Inherent costs to the energy system;
2. Energy flows inherent to each sector;
3. Technological options, including the installed capacity in the electricity production sector;
4. Energy imports and exports;
5. Use of indigenous resources, and
6. Emissions by sector.

Presently emissions considered by the model include the GHG emissions generated by combustion and industrial processes, and do not include fugitive emissions associated with the production, storage and distribution of fossil fuels and emissions of F-gases.

Note that the TIMES, being a partial equilibrium model, does not consider the economic interactions outside the energy sector, as for instance the implications in the activity of other economy sectors (e.g. impact of wind energy in the metal sector) or the implications in the activity of national sectors dictated by changes in international demand for their goods or services. Furthermore, the TIMES model does not take into account irrational aspects that influence investment in new and more efficient technologies, e.g. motivated by aesthetic preferences or social status which mainly occurs in the acquisition of end-use technologies. Thus, the model assumes that agents have perfect knowledge of the market, present and future. Finally it should be emphasized that the based technology models such as the TIMES_PT do not accommodate market decisions based on price, instead they make choices based whether technologies or energy resources costs. For this reason, the solutions found show the best options in terms of cost - effectiveness and hence competitiveness, *lato sensu*.

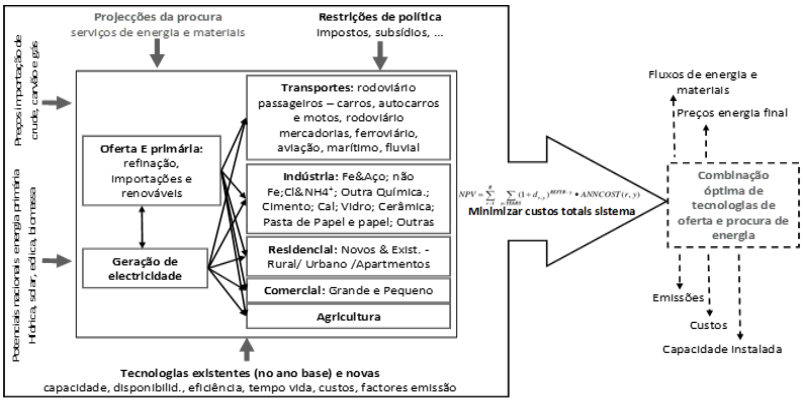

Figure 16
Simplified structure of the TIMES_PT
Source: RNBC

VIII. PROVISIONS OF FINANCIAL, TECHNOLOGICAL AND CAPACITY-BUILDING SUPPORT TO DEVELOPING COUNTRY PARTIES

A. FINANCE

Portugal's public climate finance (Table) for programmes and projects in partner countries is channelled through Official Development Assistance (ODA). In Portugal, ODA for environment has had little expression regarding total values by virtue of the strategic priorities that essentially lie in areas such as Education, Health, Security and Justice. The Portuguese Carbon Fund (FPC) is a domestic fund established in 2006 with the main objective of supporting actions at national level to meet the Portuguese commitments under the Kyoto Protocol. However, the Portuguese Carbon Fund (FPC) was revised to become a new source of funding for CC development cooperation since 2010.

The majority of Portuguese Cooperation climate related Programmes, Projects and Actions (PPA) includes capacity building components. Nevertheless the CRS does not allow actually the data tracking by component.

In this context it should be noted that under the Portuguese Cooperation the following amounts on CC cooperation have been disbursed for 2014 by country (see table VI).

Table VI: Total amount committed by country (Bilateral Cooperation - only Principal Objective)

BILATERAL COOPERATION	2013	2014
Angola	0,00 €	0,00 €
Cape Vert	12.973.752,00€	6.276.715,00 €
Mozambique	2.699.679,00 €	2.283.077,00 €
Guiné-Bissau	145.938,00 €	235.709,00 €
São Tomé e Príncipe	156.391,00 €	357.546,00 €
East Timor	0.00 €	61.269,00 €
Total	**15,975,760.00 €**	**9.214.316,00 €**
		Source: Camões, I.P. (2015)

Until December 2014, bilateral financial flows amounted to approximately 9.2 M€. Furthermore, there are still some projects undergoing implementation that will be financed in 2015 and 2016 onwards.

Table VII Provision of public financial support: contribution through multilateral channels in 2013 and 2014

Donor funding	Total amount (Core/general)				Status	Funding source	Financial instrument	Type of support	Sector
	2013		2014						
	Euro €	USD $	Euro €	USD $					
Total contributions through multilateral channels	**7,248,472.0**	**9,623,568.8**	**3.469.923,00**	**4 606 907.87**	**-**	**-**	**-**	**-**	**-**
Multilateral climate change funds	**0,0**	**0,0**	**0,0**	*0.00*	**-**	**-**	**-**	**-**	**-**
1. Global Environment Facility	*0,0*	*0,0*	*0,0*	*0.00*	-	-	-	-	-
2. Least Developed Countries Fund	*0,0*	*0,0*	*0,0*	*0.00*	-	-	-	-	-
3. Special Climate Change Fund	*0,0*	*0,0*	*0,0*	*0.00*	-	-	-	-	-
4. Adaptation Fund	*0,0*	*0,0*	*0,0*	*0.00*	-	-	-	-	-
5. Green Climate Fund	*0,0*	*0,0*	*0,0*	*0.00*	-	-	-	-	-
6. UNFCCC Trust Fund for Supplementary Activities	*0,0*	*0,0*	*0,0*	*0.00*	-	-	-	-	-
7. Other multilateral climate change funds	*0,0*	*0,0*	*0,0*	*0.00*	-	-	-	-	-
Multilateral financial institutions, including regional development banks	**7 174 210,0**	**9 524 973,4**	**3.387.387,00**	**4 497 327.42**	**-**	**-**	**-**	**-**	**-**
1. World Bank	*1,420,000.0*	*1 885 289,4*	*1.490.000,00*	*1 978 226.24*	*Provided*	*ODA*	*Grant*	*Not applicable*	*Not applicable*
2. International Finance Corporation	*0,0*	*0,0*	*0.00*	*0.00*	-	-	-	-	-
3. African Development Bank	*2 004 210,0*	*2 660 926,7*	*1.478.108,00*	*1 962 437.61*	*Provided*	*ODA*	*Grant*	*Not applicable*	*Not applicable*
4. Asian Development Bank	*0,0*	*0,0*	*250.000,00*	*331 917.15*	*Provided*	*ODA*	*Grant*	*Not applicable*	*Not applicable*
5. European Bank for Reconstruction and Development	*0,0*	*0,0*	*0.00*	*0.00*	-	-	-	-	-
6. Inter-American Development Bank	*0,0*	*0,0*	*169.279,00*	*224 746.20*	*Provided*	*ODA*	*Grant*	*Not applicable*	*Not applicable*
7. Other (CAF - Andean Development Corporation)	*3 750 000,0*	*4 978 757,3*	*0.00*	*0.00*	*Provided*	*ODA*	*Grant*	*Not applicable*	*Not applicable*
Specialized United Nations bodies	**74 262,0**	**98 595,3**	**82.536,00**	**109 580.46**	**-**	**-**	**-**	**-**	**-**
1. United Nations Development Programme	*37 288,0*	*49 506,1*	*39.872,00*	*52 936.80*	*Provided*	*ODA*	*Grant*	*Not applicable*	*Not applicable*
2. United Nations Environment Programme	*36 974,0*	*49 089,2*	*0.00*	*0.00*	*Provided*	*ODA*	*Grant*	*Not applicable*	*Not applicable*
3. Other (UNFCCC core contribution - 61% eligible as ODA)	*0,00*	*0,0*	*42.664,00*	*56 643.65*	*Provided*	*ODA*	*Grant*	*Not applicable*	*Not applicable*

1. Mitigation

The bilateral projects that had Mitigation as a Principal Objective represents 93.18% in 2013 and 94,95% of the total CC – mitigation related ODA in 2014 (**Erro! A origem da referência não foi encontrada.**).

The 2013's rates are due the financing of renewable energy projects under the Line of Credit for Cape Vert and ongoing projects in Mozambique[26]. In December 2014, Portugal has approved and begun its disbursement for two additional projects for CC mitigation: *Waste Roadmap in Cape Verde and Bioenergy use in São Tomé*.

Table VIII
Climate change related ODA - Mitigation[27]

YEAR	SIGNIFICANT OBJECTIVE	PRINCIPAL OBJECTIVE	BILATERAL ODA TOTAL
2013	334,270.00 €	15,605,329.00 €	15,939,599.00 €
	2.10 %	97.90 %	100.00 %
2014	444.605,00 €	8.359.311,00 €	8.803.916,00 €
	5,05 %	94,95 %	100 %

Source: Camões, P.I./DPC

2. Adaptation

Lately, Portugal has been paying particular attention to Adaptation to CC, specially its integration in terms of Development Cooperation (DC), thus seeking to follow international guidelines. In this context Portugal has been following the negotiations on Adaptation under the UNFCCC and, at EU and OECD level, in the latter two cases, in particular with regard to the integration of Adaptation to CC in DC policy. Thus the data in Table IX

Climate change related ODA - Adaptation[Erro! Marcador não definido.]

YEAR	*SIGNIFICANT OBJECTIVE*	*PRINCIPAL OBJECTIVE*	BILATERAL ODA TOTAL
2013	794,612.00 €	370,431.00 €	1,165,043.00 €
	68.20 %	31.80 %	100.00 %
2014	1.729.623,00 €	855.000,00 €	2.584.628,00 €
	66,92 %	33,08 %	100.00 %

Source: Camões, P.I./DPC

is representing the application of Rio Marker Adaptation to Portuguese ODA.

Table IX
Climate change related ODA - Adaptation[Erro! Marcador não definido.]

YEAR	*SIGNIFICANT OBJECTIVE*	*PRINCIPAL OBJECTIVE*	BILATERAL ODA TOTAL
2013	794,612.00 €	370,431.00 €	1,165,043.00 €
	68.20 %	31.80 %	100.00 %

[26]Ssupported by the Portuguese Fast Start Implementation Initiative.

2014	1.729.623,00 €	855.000,00 €	2.584.628,00 €
	66,92 %	33,08 %	100.00 %

Source: Camões, P.I./DPC

1. Portuguese Carbon Fund

Since 2010, the FPC was the designated source to provide financial flows for the implementation of the fast start commitment of Portugal. Given the increased interest and impact of the Environment and CC issues within the Portuguese Cooperation efforts, an inter-ministerial task force was established following the Copenhagen Conference, composed by the representatives of the Portuguese's Ministry of Foreign Affairs and MAOTE.

The financial flows provided by this Fund are additional to previous sources, meaning that previously existing flows were not redirected. The financial contribution of the FPC counts as ODA but is an independent and new source that relies entirely on the Fund's independent and autonomous income/revenues.

The FPC has continuously supported, since 2010, the ongoing implementation of approved projects and the most important source of revenues of the FPC to be used in CC cooperation is provided through the auctioning of allowances in the context of the Emissions Trading Scheme.

The FPC was established with the aim to finance activities/ projects carried out to respond to the challenges of climate change and to meet Kyoto Protocol/ UNFCCC objectives, at both domestic and international levels.

Bearing in mind that financing ODA projects is not a core objective of FPC, Portugal considers that the financing provided by FPC to activities that aim to promote the economic development and welfare of developing countries is new and additional to the current sources of ODA flows (table X).

Table X

New and Additional Financial Resources addressed to Climate Change

Years	Source of Flows	Mitigation*		Adaptation*	
		Amount Committed	*%*	*Amount Committed*	*%*
2013	***Total Flows Disbursed***	**15.605.329,00 €**	*100*	***370.431,00 €***	*100*
	Of which, Disbursements from the Portuguese Carbon Fund	2.604.770,00 €	*17*	*370.431,00 €*	*100*
2014	**Total Flows Disbursed**	**8.359.311,00 €**	100	**855.005,00 €**	100
	Of which, Disbursements from the Portuguese Carbon Fund	2.337.392,00 €	28	683.775,00 €	80

*Only Principal Objective was considered.

Source: Camões, I.P. (2015)

2. Private Financial Flows

Portugal began to collect and report this information regarding private financial flows tracking, namely guarantees, in 2014.

B. TECHNOLOGY TRANSFER

Concerning technology transfer (table XI) and considering the definition formally accepted in the UNFCCC, particularly item c, paragraphs 1 and 5 of Article 4, in several cases a PPA being implemented by the Portuguese Cooperation under the context of ODA involves technology transfer, in terms of practices and

appropriate processes to each area of the PPA as well as the necessary knowledge to implement these technologies.

Notwithstanding what was already said, it becomes difficult to specify a case due to the policy of statistical report of the OECD/ DAC that currently does not foresee a marker for the transfer of technology that allows the qualification of the PPA in this perspective or to specifically identify the technology or technologies transferred in each case. However that in the context of the approval process, one of the criteria relates specifically to the issue of technology transfer.

Portuguese cooperative action in the context of tackling CChas increased significantly since the establishment (in 2005) of the Network of CC Offices of CPLP countries, which seeks the development and implementation of actions in the area of training and cooperation with our partner countries, including PALOP's and East Timor.

In this context, the Portuguese Ministry of Environment, Spatial Planning and Energy (MAOTE) started the promotion of some activities and projects which focused on the transfer of know–how, processes and technology for these countries, in different sectors and aligned with the strategic vision for Portuguese Cooperation. The energy sector, and particularly renewables, has been a recurring commitment of the Portuguese Cooperation and two worthy examples to highlight are the projects conducted in Mozambique in the last years.

Portugal has also been involved in the translation of a technical document related to CC - a guidebook which provides ways to identify approaches to integrate adaptation into national development policies at a sectoral and project level, both in the urban and rural environment.

C. CAPACITY BUILDING

When it comes to Development Cooperation, Portugal has paid special attention to capacity building (see table XI) at institutional level when prioritizing the Portuguese Speaking African Countries and East Timor in the bilateral context or in the CPLP. This is true both for PPA that are exclusively dedicated to capacity building or when capacity building is a component included in the PPA. The intention is to develop strengths in existing national systems in the recipient countries in a way to produce capabilities for autonomous problem solving.

The PPA supported by the Portuguese Cooperation usually has a strong technical assistance component with strong focus on the development of national capacities. Portugal tries to pay special attention to the efficiency and aid principles formally assumed in the Declaration of Paris and developed in Accra and Busan, especially:

- leadership and control by beneficiaries so they can strategically earmark their resources;
- enhance existing capabilities as a starting point, avoiding the creation of parallel structures and systematically using the national systems for aid implementation;
- technical driven cooperation for the demand of partners.

Regarding the Portuguese cooperation projects on CC, several projects should be highlighted, such as:

a) 50 Villages;
b) Atlas of the renewable energy[28] (developed in Mozambique by FUNAE);
c) Implementation of Pilot Projects Local Adaptation Program of Action in Mozambique.
d) Plan for Urban Drainage from the perspective of Emission Reduction and Adaptation to Climate Change;
e) Waste Roadmap of Cape Verde

[28]Concluded in 2013.

f) Bioenergy use in São Tomé e Príncipe

Regarding projects with more than one country as a promoter, Cape Verde, Mozambique and São Tomé e Príncipe are taking part in the two following examples:

a) Capacity Building for the Low Carbon Resilient Development Strategies;
b) Integrating Adaptation to Climate Change into Development.

Table XI Provision of public financial support: contribution through bilateral, regional and other channels in 2013

Recipient country/ region/ project/ programme	Total amount (Climate-specific)				Sector	Additional information
	2013		*2014*			
	Euro (€)	*USD ($)*	*Euro (€)*	*USD ($)*		
Total contributions through bilateral, regional and other channels	15,975,760.00	21,210,515.14	9,214,316.00	12 225 442.40	-	-
LOAN						
MITIGATION	2013		2014		Sector	Additional Information
	Euro (€)	*USD ($)*	*Euro (€)*	*USD ($)*		
Line of Credit of 100 Million euro for imports[29] - Cabo Verde (CV)	8,386,816.00	11,134,912,37	5,840,869.00	7 754 738.47	EGS[30]	TT[31]
ODA Loan of 4.5M€ for imports[32] - Cabo Verde	4,449,175.00	5,907,030.01	20,014.00	26 571.96	EGS	TT
GRANT						
MITIGATION	*2013*		2014		Sector	Additional Information
	Euro (€)	*USD ($)*	*Euro (€)*	*USD ($)*		
Capacity Building for Developing Strategies on Low Carbon Resilient (Cabo Verde)	90,190.00	119,742.43	180,381.00	239 486.19	GEP[33]	CB[34]
Capacity Building for Developing Strategies on Low Carbon Resilient (São Tomé & Príncipe - STP)	90,190.00	119,742.43	180,381.00	239 486.19	GEP	CB
Capacity Building for Developing Strategies on Low Carbon Resilient (Mozambique)	90,190.00	119,742.43	180,381.00	239 486.19	GEP	CB
TESE - NGO support to Provide electricity (using renewable energies) to schools (São Tomé & Príncipe)	18,630.00	24,734.47	-	-	EGS	TT
Atlas of renewable energy (Mozambique)	924,805.00	1,227,834.57	554,882.00	736 699.42	EGS	TT
Installation of photovoltaic systems (Mozambique)	1,409,395.00	1,871,209.51	227,149.00	301 578.60	EGS	TT & CB
Roadmap of waste (Cabo Verde)	-	-	150,000.00	199 150.29	WS[35]	TT & CB
Cooperation between Águas de Portugal and CV in the water and sanitation sector (Cabo Verde)	-	-	1,058.00	1 404.67	WS	CB
Energy generation from biogas (São Tomé & Príncipe)	-	-	98,814.00	131 192.25	EGS	TT
National Plan for Support of Urban Sanitation in the perspective of Reducing Emissions and Climate Change Adaption (PLASU-AC) - Mozambique	-	-	765,404.00	1 016 202.87	WS	CB
Community Access Program to Renewable Energy – Bambadinca of Guinea-Bissau (GB)	145,938.00	193,757.30	159,978.00	212 397.77	EGS	TT
ADAPTATION	2013		2014		Sector	Additional Information
	Euro (€)	*USD ($)*	*Euro (€)*	*USD ($)*		
IAMCD - Mainstreaming Adaptation to Climate Change in Development (Cabo Verde)	47,571.00	63,158.52	76,113.00	101 052.84	GEP	CB
IAMCD - Mainstreaming Adaptation to Climate Change in Development (São Tomé & Príncipe)	47,571.00	63,158.52	76,113.00	101 052.84	GEP	CB
IAMCD - Mainstreaming Adaptation to Climate Change in Development (Mozambique)	47,571.00	63,158.52	76,113.00	101 052.84	GEP	CB
NGO ADPM - A Sustainable Development for Chã de Norte (Cabo Verde)	-	-	8,280.00	10 993.10	OM	TT
NGO TESE - Program of Institutional Strengthening and Quality of Water Supply Service in the cities of Bafatá, Bambadinca & Mansoa (Guinea Bissau)	-	-	75,000.00	99 575.15	WS	TT & CB
NGO OIKOS - A ''comunidade-modelo'' (Mozambique)	-	-	11,832.00	15 708.98	HA[36]	TT & CB
NGO OIKOS - Improved Resistance to Natural Disasters (Mozambique)	-	-	11,880.00	15 772.70	HA	TT & CB
Cooperation between Águas de Portugal (ÁgPT) & GB in the water & sanitation sector (Guinea – Bissau)	-	-	731.00	970.53	WS	CB
Cooperation between ÁgPT & STP in the water & sanitation sector (São Tomé & Principe).	-	-	2,238.00	2 971.32	WS	CB
Cooperation between ÁgPT & Timor Leste in the water & sanitation sector (Timor Leste)	-	-	61,269.00	81 344.93	OM	
Pilot-projects implementation of Local Action Programmes in Climate Change Adaptation in Mozambique - IPPALAM (Mozambique)	227,718.00	302,334.04	455,436.00	604 668.08	OT[37]	CB

[29] Renewable energies, environment and water.

[30] Energy Generation and Supply (EGS).

[31] Technology Transfer (TT).

[32] Renewable energies, environment and water.

[33] General Environment Protection (GEP).

[34] Capacity Building (CB).

[35] Water and Sanitation (WS).

[36] Humanitarian Aid (HÁ).

[37] Other Multisector (OM).

IX. COMMON TABLE FORMAT

Table 1a

GREENHOUSE GAS SOURCE AND SINK CATEGORIES (CO_2)	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	kt										
1. Energy	40 210,77	40 210,77	41 747,61	46 273,47	44 936,13	45 534,61	49 042,14	46 313,16	48 925,33	53 377,37	60 705,23
A. Fuel combustion (sectoral approach)	39 946,37	39 946,37	41 481,89	45 995,95	44 641,29	44 996,94	48 334,44	45 672,74	48 151,48	52 629,37	60 004,30
1. Energy industries	16 297,31	16 297,31	16 920,35	19 990,43	18 049,12	17 233,72	19 867,23	15 910,65	16 634,12	19 253,27	25 311,46
2. Manufacturing industries and construction	9 655,92	9 655,92	9 764,09	10 201,78	10 229,15	10 544,93	10 762,28	11 021,27	12 004,94	11 926,87	12 016,14
3. Transport	9 827,58	9 827,58	10 398,02	11 260,96	11 669,21	12 267,76	12 897,15	13 542,82	14 324,81	16 070,09	16 905,64
4. Other sectors	4 061,86	4 061,86	4 286,81	4 457,19	4 615,35	4 865,97	4 726,49	5 093,86	5 087,57	5 274,83	5 691,28
5. Other	103,69	103,69	112,61	85,60	78,46	84,57	81,30	104,14	100,05	104,30	79,77
B. Fugitive emissions from fuels	264,40	264,40	265,72	277,51	294,84	537,66	707,69	640,42	773,85	748,00	700,93
1. Solid fuels	10,20	10,20	9,47	8,53	8,67	6,65	1,83	1,72	1,63	1,55	1,48
2. Oil and natural gas and other emissions from energy production	254,19	254,19	256,26	268,98	286,18	531,01	705,86	638,70	772,22	746,46	699,45
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Industrial processes	4 644,91	4 644,91	4 748,38	4 452,90	4 455,13	4 515,14	5 031,97	5 122,59	5 346,29	5 423,87	5 782,90
A. Mineral industry	3 585,65	3 585,65	3 714,35	3 613,52	3 690,00	3 831,04	4 047,42	3 975,57	4 199,21	4 220,31	4 533,18
B. Chemical industry	658,41	658,41	657,95	423,48	375,42	281,34	586,25	726,52	716,05	770,31	826,70
C. Metal industry	122,13	122,13	102,41	149,36	143,27	147,19	144,82	147,90	153,36	142,08	153,09
D. Non-energy products from fuels and solvent use	250,51	250,51	247,12	239,49	220,69	230,42	229,78	248,17	251,61	264,38	243,51
E. Electronic industry	-	-	-	-	-	-	-	-	-	-	-
F. Product uses as ODS substitutes	-	-	-	-	-	-	-	-	-	-	-
G. Other product manufacture and use	-	-	-	-	-	-	-	-	-	-	-
H. Other	28,21	28,21	26,55	27,04	25,75	25,15	23,69	24,43	26,06	26,79	26,42
3. Agriculture	33,87	33,87	33,87	33,87	33,87	33,87	23,84	35,03	36,92	24,95	35,73
A. Enteric fermentation	-	-	-	-	-	-	-	-	-	-	-
B. Manure management	-	-	-	-	-	-	-	-	-	-	-
C. Rice cultivation	-	-	-	-	-	-	-	-	-	-	-
D. Agricultural soils	-	-	-	-	-	-	-	-	-	-	-
E. Prescribed burning of savannas	-	-	-	-	-	-	-	-	-	-	-
F. Field burning of agricultural residues	-	-	-	-	-	-	-	-	-	-	-
G. Liming	12,59	12,59	12,59	12,59	12,59	12,59	12,59	12,59	12,59	12,59	12,59
H. Urea application	21,28	21,28	21,28	21,28	21,28	21,28	11,25	22,43	24,33	12,36	23,14
I. Other carbon-containing fertilizers	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. Land Use, Land-Use Change and Forestry	1 036,95	1 036,95	990,53	-3 614,09	-4 744,47	-5 476,17	-5 258,11	-8 967,54	-9 873,47	-7 719,80	-8 758,53
A. Forest land	-5 784,67	-5 784,67	-5 428,63	-9 658,72	-10 417,89	-10 561,80	-8 592,54	-11 953,58	-13 020,98	-11 025,25	-11 741,83
B. Cropland	4 335,51	4 335,51	3 994,98	3 654,50	3 313,91	3 046,95	2 817,53	2 563,59	2 309,65	2 055,76	1 945,56
C. Grassland	3 335,72	3 335,72	3 412,29	3 488,87	3 565,44	3 644,91	2 606,11	2 618,06	2 630,01	2 641,96	2 495,53
D. Wetlands	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	114,77	143,08	171,39	199,70	228,01
E. Settlements	30,49	30,49	38,01	40,55	43,02	45,57	536,42	665,00	793,78	922,55	1 051,54

F. Other land	865,23	865,23	513,88	162,38	-189,28	-540,80	-1 750,39	-1 815,68	-1 880,97	-1 946,18	-2 011,35
G. Harvested wood products	-1 745,33	-1 745,33	-1 540,00	-1 301,67	-1 059,67	-1 111,00	-990,00	-1 188,00	-876,33	-568,33	-726,00
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Waste	6,86	6,86	6,91	6,96	7,01	7,07	7,12	7,69	8,56	7,19	6,74
A. Solid waste disposal	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Biological treatment of solid waste	-	-	-	-	-	-	-	-	-	-	-
C. Incineration and open burning of waste	6,86	6,86	6,91	6,96	7,01	7,07	7,12	7,69	8,56	7,19	6,74
D. Waste water treatment and discharge	-	-	-	-	-	-	-	-	-	-	-
E. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:											
International bunkers	2 850,79	2 850,79	2 912,16	2 998,10	2 697,58	2 601,86	2 721,75	2 767,36	2 788,57	2 892,29	3 423,94
Aviation	1 464,82	1 464,82	1 537,05	1 626,17	1 540,79	1 549,34	1 614,17	1 598,90	1 649,55	1 744,89	1 924,58
Navigation	1 385,97	1 385,97	1 375,11	1 371,93	1 156,79	1 052,52	1 107,58	1 168,46	1 139,02	1 147,40	1 499,36
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 emissions from biomass	11 400,71	11 400,71	11 432,74	11 384,80	11 140,30	10 912,67	11 042,56	11 117,89	11 309,97	11 140,37	11 408,70
CO_2 captured	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO
Long-term storage of C in waste disposal sites	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Indirect N_2O	-	-	-	-	-	-	-	-	-	-	-
Indirect CO_2 (3)	298,09	298,09	294,99	297,52	289,07	298,55	293,80	305,05	318,72	319,69	325,50
Total CO_2 equivalent emissions without land use, land-use change and forestry	60 425,62	60 425,62	62 292,03	66 693,60	65 372,87	66 518,18	71 121,70	68 707,88	71 771,17	76 743,46	84 833,72
Total CO_2 equivalent emissions with land use, land-use change and forestry	62 208,46	62 208,46	64 092,63	63 651,41	61 166,46	61 620,34	66 597,41	60 285,71	62 372,83	69 688,91	76 621,92
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry	45 194,51	45 194,51	46 831,76	51 064,71	49 721,22	50 389,23	54 398,86	51 783,51	54 635,82	59 153,06	66 856,10
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry	46 231,46	46 231,46	47 822,29	47 450,62	44 976,75	44 913,06	49 140,76	42 815,97	44 762,36	51 433,26	58 097,56

Table 1a (cont.)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES (CO_2)	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	kt									
1. Energy	59 461,57	63 019,51	57 987,04	60 202,73	62 766,07	58 479,27	55 378,91	53 458,87	52 233,72	47 617,91
A. Fuel combustion (sectoral approach)	58 674,83	62 238,16	57 135,85	59 370,87	61 811,71	57 576,27	54 522,55	52 551,91	51 296,10	46 717,23
1. Energy industries	21 937,14	25 332,75	20 831,96	22 295,09	25 293,78	22 354,89	19 709,11	19 108,30	19 254,16	14 368,43
2. Manufacturing industries and construction	11 386,33	10 879,58	10 252,66	10 734,54	10 521,75	10 314,69	10 426,49	9 697,39	8 482,28	9 036,63
3. Transport	18 973,83	19 450,88	19 353,22	19 326,24	19 121,16	19 190,68	18 817,35	18 538,46	18 529,72	18 319,77
4. Other sectors	6 282,79	6 508,46	6 645,00	6 974,68	6 802,47	5 640,67	5 496,97	5 122,83	4 944,65	4 906,89
5. Other	94,73	66,50	53,00	40,33	72,56	75,34	72,62	84,93	85,28	85,52
B. Fugitive emissions from fuels	786,74	781,35	851,19	831,86	954,36	903,00	856,36	906,96	937,62	900,68
1. Solid fuels	1,37	1,32	1,27	1,23	1,20	1,16	1,13	1,10	1,08	1,05
2. Oil and natural gas and other emissions from energy production	785,37	780,03	849,91	830,62	953,16	901,84	855,23	905,85	936,54	899,63
C. CO_2 transport and storage	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Industrial processes	5 558,06	5 756,51	5 626,21	6 061,51	6 018,49	5 725,62	6 135,82	5 967,74	4 428,56	4 542,00
A. Mineral industry	4 431,64	4 702,57	4 385,84	4 808,94	4 861,04	4 777,78	5 000,99	4 900,43	4 012,35	4 126,02
B. Chemical industry	759,87	724,59	905,16	908,09	816,18	598,88	786,45	709,42	116,30	133,53
C. Metal industry	77,13	47,80	61,40	72,31	80,44	95,25	92,23	111,76	72,23	48,63
D. Non-energy products from fuels and solvent use	260,23	251,35	245,06	241,03	230,99	226,23	227,42	216,44	196,51	202,48
E. Electronic industry	-	-	-	-	-	-	-	-	-	-
F. Product uses as ODS substitutes	-	-	-	-	-	-	-	-	-	-
G. Other product manufacture and use	-	-	-	-	-	-	-	-	-	-
H. Other	29,19	30,21	28,75	31,14	29,85	27,49	28,73	29,68	31,17	31,34
3. Agriculture	40,53	28,64	27,31	25,32	29,81	43,39	47,66	55,21	52,92	34,57
A. Enteric fermentation	-	-	-	-	-	-	-	-	-	-
B. Manure management	-	-	-	-	-	-	-	-	-	-
C. Rice cultivation	-	-	-	-	-	-	-	-	-	-
D. Agricultural soils	-	-	-	-	-	-	-	-	-	-
E. Prescribed burning of savannas	-	-	-	-	-	-	-	-	-	-
F. Field burning of agricultural residues	-	-	-	-	-	-	-	-	-	-
G. Liming	12,59	12,59	12,59	12,24	10,92	10,80	12,62	13,75	14,56	12,49
H. Urea application	27,94	16,05	14,72	13,08	18,89	32,60	35,03	41,46	38,36	22,09
I. Other carbon-containing fertilizers	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. Land Use, Land-Use Change and Forestry	-9 969,47	-9 551,62	333,72	-8 666,13	-692,45	-9 604,80	-13 093,56	-14 497,20	-14 383,65	-11 906,60
A. Forest land	-12 371,94	-11 760,15	-1 549,13	-10 395,55	-2 460,61	-11 216,55	-14 009,13	-14 995,80	-15 127,12	-13 290,08
B. Cropland	1 729,78	1 619,53	1 509,29	1 399,00	1 270,64	1 141,52	822,34	669,48	650,39	610,54
C. Grassland	2 202,96	2 056,55	1 910,08	1 763,65	1 596,11	1 428,97	1 145,92	872,25	753,14	620,91
D. Wetlands	284,63	312,93	341,24	369,55	397,86	426,36	366,27	373,60	380,92	388,24
E. Settlements	1 309,42	1 438,41	1 567,53	1 696,58	1 825,93	1 955,02	1 941,32	2 023,59	2 105,84	2 188,11
F. Other land	-2 141,65	-2 206,90	-2 271,96	-2 337,04	-2 402,04	-2 467,46	-2 777,28	-2 816,98	-2 505,15	-2 193,32

G. Harvested wood products	-982,67	-1 012,00	-1 173,33	-1 162,33	-920,33	-872,67	-583,00	-623,33	-641,67	-231,00
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
5. Waste	1,39	1,28	6,46	1,66	1,96	2,26	3,56	4,28	8,95	10,00
A. Solid waste disposal	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
B. Biological treatment of solid waste	-	-	-	-	-	-	-	-	-	-
C. Incineration and open burning of waste	1,39	1,28	6,46	1,66	1,96	2,26	3,56	4,28	8,95	10,00
D. Waste water treatment and discharge	-	-	-	-	-	-	-	-	-	-
E. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:										
International bunkers	3 081,18	3 053,38	3 520,74	3 928,30	3 794,39	4 065,07	4 283,82	4 563,67	4 153,50	4 228,91
Aviation	1 931,86	1 836,31	2 017,61	2 173,26	2 256,80	2 387,77	2 519,88	2 609,15	2 372,60	2 610,71
Navigation	1 149,32	1 217,06	1 503,12	1 755,04	1 537,59	1 677,30	1 763,94	1 954,52	1 780,90	1 618,20
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 emissions from biomass	11 303,94	11 152,21	10 833,46	11 280,86	11 191,94	11 568,50	11 738,27	11 616,62	11 979,12	12 894,39
CO_2 captured	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO
Long-term storage of C in waste disposal sites	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Indirect N_2O	-	-	-	-	-	-	-	-	-	-
Indirect CO_2 (3)	296,93	283,35	276,71	275,56	269,06	269,81	273,11	262,93	240,89	249,69
Total CO_2 equivalent emissions without land use, land-use change and forestry	83 504,54	87 653,59	82 509,23	85 408,08	87 898,18	82 827,19	80 314,94	78 060,58	75 034,82	70 338,99
Total CO_2 equivalent emissions with land use, land-use change and forestry	74 078,86	78 712,82	84 084,69	77 306,30	88 245,81	73 720,64	67 627,68	63 925,06	61 055,44	58 947,63
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry	65 358,48	69 089,29	63 923,73	66 566,79	69 085,39	64 520,36	61 839,06	59 749,02	56 965,03	52 454,18
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry	55 389,01	59 537,68	64 257,45	57 900,66	68 392,94	54 915,56	48 745,50	45 251,82	42 581,38	40 547,58

Table 1a (cont.)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES (CO_2)	2011	2012	2013	Change from base to latest reported year
	kt			%
1. Energy	46 956,98	45 355,26	43 428,80	8,00
A. Fuel combustion (sectoral approach)	46 056,29	44 404,37	41 857,75	4,78
1. Energy industries	16 349,36	17 318,60	15 109,70	-7,29
2. Manufacturing industries and construction	8 297,97	7 358,93	7 321,46	-24,18
3. Transport	17 006,51	15 530,73	15 290,41	55,59
4. Other sectors	4 325,54	4 147,80	4 078,02	0,40
5. Other	76,90	48,32	58,16	-43,91
B. Fugitive emissions from fuels	900,69	950,88	1 571,05	494,20
1. Solid fuels	1,03	1,01	0,99	-90,33
2. Oil and natural gas and other emissions from energy production	899,66	949,87	1 570,06	517,66
C. CO_2 transport and storage	NO	NO	NO	-
2. Industrial processes	3 905,59	3 734,26	3 914,81	-15,72
A. Mineral industry	3 497,85	3 363,30	3 549,80	-1,00
B. Chemical industry	130,92	98,03	89,61	-86,39
C. Metal industry	53,66	61,74	65,69	-46,21
D. Non-energy products from fuels and solvent use	194,11	181,64	179,14	-28,49
E. Electronic industry	-	-	-	-
F. Product uses as ODS substitutes	-	-	-	-
G. Other product manufacture and use	-	-	-	-
H. Other	29,06	29,56	30,56	8,33
3. Agriculture	47,97	45,72	50,84	50,11
A. Enteric fermentation	-	-	-	-
B. Manure management	-	-	-	-
C. Rice cultivation	-	-	-	-
D. Agricultural soils	-	-	-	-
E. Prescribed burning of savannas	-	-	-	-
F. Field burning of agricultural residues	-	-	-	-
G. Liming	12,59	12,59	12,59	0,00
H. Urea application	35,38	33,13	38,25	79,76
I. Other carbon-containing fertilizers	NO	NO	NO	-
J. Other	NO	NO	NO	-
4. Land Use, Land-Use Change and Forestry	-14 099,00	-10 697,63	-9 908,79	-1 055,57
A. Forest land	-15 219,95	-12 222,65	-12 609,66	117,98
B. Cropland	604,73	600,84	598,57	-86,19
C. Grassland	482,06	380,98	302,12	-90,94
D. Wetlands	395,57	402,89	410,22	-
E. Settlements	2 268,09	2 348,00	2 427,88	7 862,82

F. Other land	-1 881,51	-1 569,70	-1 257,92	-245,39
G. Harvested wood products	-748,00	-638,00	220,00	-112,61
H. Other	NO	NO	NO	-
5. Waste	8,01	11,19	14,02	104,22
A. Solid waste disposal	NO	NO	NO	-
B. Biological treatment of solid waste	-	-	-	-
C. Incineration and open burning of waste	8,01	11,19	14,02	104,22
D. Waste water treatment and discharge	-	-	-	-
E. Other	NA	NA	NA	-
6. Other (as specified in the summary table in CRF)	NO	NO	NO	-
Memo items:				
International bunkers	4 638,22	4 803,34	4 986,03	74,90
Aviation	2 705,75	2 726,96	2 797,92	91,01
Navigation	1 932,47	2 076,37	2 188,11	57,88
Multilateral operations	NO	NO	NO	-
CO_2 emissions from biomass	11 294,61	10 999,81	11 052,31	-3,06
CO_2 captured	IE,NO	IE,NO	IE,NO	-
Long-term storage of C in waste disposal sites	NE	NE	NE	-
Indirect N_2O	-	-	-	-
Indirect CO_2 (3)	238,39	232,93	236,16	-20,78
Total CO_2 equivalent emissions without land use, land-use change and forestry	68 944,15	66 955,92	65 071,46	7,69
Total CO_2 equivalent emissions with land use, land-use change and forestry	55 255,25	56 801,04	55 681,89	-10,49
Total CO_2 equivalent emissions, including indirect CO_2, without land use, land-use change and forestry	51 156,93	49 379,35	47 644,63	5,42
Total CO_2 equivalent emissions, including indirect CO_2, with land use, land-use change and forestry	37 057,93	38 681,72	37 735,84	-18,38

Table 1b

GREENHOUSE GAS SOURCE AND SINK CATEGORIES (CH_4)	Base year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	kt										
1. Energy	27,62	27,62	26,96	26,78	26,43	25,70	23,99	23,62	25,37	28,12	30,21
A. Fuel combustion (sectoral approach)	22,25	22,25	21,91	21,88	21,38	21,10	21,12	21,06	20,62	20,24	19,94
1. Energy industries	0,22	0,22	0,22	0,26	0,24	0,25	0,27	0,23	0,24	0,28	0,45
2. Manufacturing industries and construction	1,32	1,32	1,41	1,48	1,46	1,48	1,57	1,59	1,72	1,74	1,83
3. Transport	4,14	4,14	4,43	4,80	4,68	4,52	4,43	4,34	4,17	4,16	4,01
4. Other sectors	16,57	16,57	15,85	15,32	14,99	14,85	14,84	14,90	14,49	14,06	13,65
5. Other	0,01	0,01	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00
B. Fugitive emissions from fuels	5,37	5,37	5,05	4,90	5,04	4,60	2,86	2,56	4,74	7,88	10,27
1. Solid fuels	3,54	3,54	3,29	2,96	3,02	2,32	0,67	0,63	0,59	0,56	0,54
2. Oil and natural gas and other emissions from energy production	1,83	1,83	1,76	1,94	2,02	2,27	2,20	1,94	4,15	7,32	9,73
C. CO_2 transport and storage	-	-	-	-	-	-	-	-	-	-	-
2. Industrial processes	0,83	0,83	0,71	0,84	0,84	0,87	0,89	0,84	1,00	1,08	1,09
A. Mineral industry	-	-	-	-	-	-	-	-	-	-	-
B. Chemical industry	0,57	0,57	0,46	0,50	0,51	0,54	0,55	0,50	0,60	0,67	0,66
C. Metal industry	0,22	0,22	0,20	0,27	0,28	0,27	0,27	0,28	0,32	0,32	0,36
D. Non-energy products from fuels and solvent use	0,04	0,04	0,05	0,06	0,06	0,06	0,07	0,06	0,08	0,09	0,07
E. Electronic industry	-	-	-	-	-	-	-	-	-	-	-
F. Product uses as ODS substitutes	-	-	-	-	-	-	-	-	-	-	-
G. Other product manufacture and use	-	-	-	-	-	-	-	-	-	-	-
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	197,13	197,13	200,99	199,71	194,77	200,66	207,60	207,68	204,46	209,16	213,27
A. Enteric fermentation	133,71	133,71	135,99	135,76	131,12	137,55	144,21	146,01	142,77	147,50	151,35
B. Manure management	56,58	56,58	58,78	58,87	59,11	58,53	57,87	55,88	55,58	55,74	56,27
C. Rice cultivation	5,36	5,36	4,76	3,69	3,20	3,27	4,16	4,43	4,74	4,57	4,32
D. Agricultural soils	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	1,49	1,49	1,45	1,39	1,34	1,32	1,36	1,36	1,37	1,35	1,33
G. Liming	-	-	-	-	-	-	-	-	-	-	-
H. Urea application	-	-	-	-	-	-	-	-	-	-	-
I. Other carbon-containing fertilizers	-	-	-	-	-	-	-	-	-	-	-
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. Land use, land-use change and forestry	8,20	8,20	11,06	3,52	3,01	4,81	10,26	3,88	1,57	8,20	4,26
A. Forest land	7,15	7,15	9,57	3,06	2,60	4,18	8,87	3,25	1,41	7,17	3,79
B. Cropland	0,65	0,65	0,86	0,27	0,24	0,37	0,81	0,21	0,05	0,38	0,21
C. Grassland	0,24	0,24	0,32	0,10	0,09	0,13	0,29	0,18	0,04	0,30	0,12
D. Wetlands	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Settlements	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Other land	0,16	0,16	0,30	0,09	0,08	0,13	0,28	0,24	0,07	0,35	0,14
G. Harvested wood products	-	-	-	-	-	-	-	-	-	-	-
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

5. Waste	227,99	227,99	235,12	244,06	250,47	262,71	271,62	270,55	279,69	290,06	292,45
A. Solid waste disposal	109,14	109,14	114,31	120,21	126,24	132,41	138,83	145,40	152,36	159,89	168,93
B. Biological treatment of solid waste	0,45	0,45	0,18	0,23	0,29	0,62	0,82	0,82	0,84	0,86	0,90
C. Incineration and open burning of waste	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
D. Waste water treatment and discharge	118,39	118,39	120,61	123,61	123,92	129,66	131,96	124,32	126,48	129,30	122,61
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total CH_4 emissions without CH_4 from LULUCF	453,57	453,57	463,78	471,39	472,51	489,94	504,09	502,70	510,53	528,41	537,03
Total CH_4 emissions with CH_4 from LULUCF	461,77	461,77	474,83	474,92	475,52	494,75	514,35	506,58	512,09	536,62	541,29
Memo items:											
International bunkers	0,25	0,25	0,25	0,26	0,23	0,22	0,23	0,23	0,23	0,24	0,29
Aviation	0,12	0,12	0,13	0,13	0,12	0,12	0,13	0,12	0,12	0,14	0,15
Navigation	0,13	0,13	0,13	0,13	0,11	0,10	0,10	0,11	0,11	0,11	0,14
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 emissions from biomass	-	-	-	-	-	-	-	-	-	-	-
CO_2 captured	-	-	-	-	-	-	-	-	-	-	-
Long-term storage of C in waste disposal sites	-	-	-	-	-	-	-	-	-	-	-
Indirect N_2O	-	-	-	-	-	-	-	-	-	-	-
Indirect CO_2 (3)	-	-	-	-	-	-	-	-	-	-	-

Table 1b (cont.)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES (CH_4)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year
	kt														%
1. Energy	29,13	43,00	46,76	47,68	37,15	36,59	23,58	24,58	36,36	44,92	28,08	21,81	21,39	21,64	-21,66
A. Fuel combustion (sectoral approach)	19,46	18,56	18,20	17,39	16,84	16,26	15,58	15,01	14,29	13,86	13,30	13,68	13,42	13,56	-39,07
1. Energy industries	0,52	0,50	0,55	0,51	0,54	0,58	0,55	0,51	0,54	0,57	0,55	0,57	0,53	0,51	136,20
2. Manufacturing industries and construction	1,85	1,83	1,88	1,86	1,93	1,95	1,95	2,03	1,98	2,03	2,01	1,97	1,94	1,93	46,89
3. Transport	3,84	3,37	3,33	3,01	2,78	2,54	2,31	2,12	1,85	1,76	1,63	1,43	1,25	1,19	-71,11
4. Other sectors	13,25	12,85	12,44	12,01	11,60	11,20	10,77	10,35	9,92	9,50	9,10	9,71	9,70	9,91	-40,17
5. Other	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-95,02
B. Fugitive emissions from fuels	9,66	24,44	28,56	30,29	20,31	20,32	8,00	9,57	22,07	31,05	14,79	8,12	7,97	8,08	50,44
1. Solid fuels	0,52	0,50	0,48	0,46	0,45	0,43	0,42	0,41	0,40	0,39	0,38	0,37	0,37	0,36	-89,86
2. Oil and natural gas and other emissions from energy production	9,15	23,95	28,09	29,83	19,87	19,89	7,58	9,16	21,66	30,66	14,40	7,75	7,60	7,72	321,93
C. CO_2 transport and storage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Industrial processes	1,16	1,04	1,04	1,13	1,33	1,36	1,31	1,42	1,37	1,11	1,25	1,35	1,11	1,18	43,10
A. Mineral industry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B. Chemical industry	0,68	0,57	0,61	0,68	0,77	0,75	0,67	0,75	0,64	0,51	0,69	0,67	0,43	0,50	-12,29
C. Metal industry	0,40	0,36	0,34	0,37	0,47	0,50	0,56	0,60	0,65	0,52	0,50	0,63	0,63	0,65	190,73
D. Non-energy products from fuels and solvent use	0,08	0,11	0,09	0,07	0,09	0,11	0,08	0,08	0,08	0,08	0,06	0,06	0,05	0,04	7,33
E. Electronic industry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Product uses as ODS substitutes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G. Other product manufacture and use	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
3. Agriculture	213,41	207,74	202,07	196,76	201,08	202,38	201,46	199,17	199,65	194,87	192,73	190,55	189,73	187,35	-4,96
A. Enteric fermentation	152,67	149,29	146,46	143,01	147,27	148,48	147,56	145,53	145,68	141,16	139,12	136,71	135,84	133,50	-0,15
B. Manure management	54,76	52,49	49,58	47,35	46,89	46,75	46,87	46,75	46,97	47,20	46,93	46,69	46,74	46,90	-17,11
C. Rice cultivation	4,70	4,70	4,79	5,18	5,80	6,08	5,97	5,79	5,92	5,37	5,53	5,99	5,97	5,77	7,74
D. Agricultural soils	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
F. Field burning of agricultural residues	1,27	1,26	1,25	1,22	1,12	1,07	1,07	1,10	1,09	1,14	1,15	1,17	1,18	1,18	-20,90
G. Liming	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H. Urea application	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I. Other carbon-containing fertilizers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
4. Land use, land-use change and forestry	7,40	4,43	6,88	28,69	5,55	22,31	4,11	1,67	0,85	2,28	6,07	2,43	6,97	6,14	-25,13
A. Forest land	6,04	3,98	5,97	24,51	4,36	20,81	3,58	1,15	0,64	1,71	5,19	1,88	6,17	4,87	-31,84
B. Cropland	0,67	0,17	0,60	3,26	0,73	0,92	0,34	0,39	0,14	0,18	0,24	0,25	0,58	0,84	30,53
C. Grassland	0,35	0,12	0,17	0,61	0,29	0,24	0,10	0,06	0,04	0,23	0,26	0,17	0,14	0,25	2,70
D. Wetlands	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
E. Settlements	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
F. Other land	0,35	0,16	0,14	0,32	0,17	0,34	0,09	0,06	0,03	0,16	0,38	0,13	0,08	0,17	6,36
G. Harvested wood products	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
5. Waste	287,94	290,68	302,58	315,30	320,09	319,56	314,37	308,53	287,81	282,19	288,76	299,22	286,84	278,33	22,08
A. Solid waste disposal	178,02	183,84	188,72	192,75	192,64	187,06	185,83	184,49	182,05	183,02	178,69	177,75	169,79	160,17	46,76
B. Biological treatment of solid waste	1,10	1,07	0,46	1,66	1,00	0,99	0,58	0,61	0,73	0,93	1,02	0,80	0,90	0,87	95,68
C. Incineration and open burning of waste	0,01	0,01	0,01	0,01	0,02	0,03	0,05	0,06	0,07	0,06	0,02	0,06	0,02	0,04	254,59
D. Waste water treatment and discharge	108,81	105,77	113,39	120,88	126,43	131,47	127,90	123,38	104,95	98,16	109,04	120,62	116,13	117,25	-0,97
E. Other	NO	NO	NO	NO	NO	0,00	0,00	0,00	0,00	0,00	0,00	0,00	NO	NO	-
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
Total CH_4 emissions without CH_4 from LULUCF	531,63	542,46	552,45	560,88	559,67	559,89	540,71	533,71	525,19	523,08	510,83	512,94	499,07	488,50	7,70
Total CH_4 emissions with CH_4 from LULUCF	539,03	546,90	559,33	589,57	565,21	582,20	544,82	535,38	526,03	525,36	516,89	515,37	506,04	494,64	7,12
Memo items:															
International bunkers	0,25	0,20	0,20	0,23	0,24	0,22	0,22	0,24	0,26	0,23	0,22	0,25	0,27	0,28	9,07
Aviation	0,10	0,09	0,09	0,09	0,08	0,07	0,07	0,07	0,08	0,07	0,08	0,08	0,08	0,07	-40,18
Navigation	0,15	0,11	0,11	0,14	0,16	0,14	0,15	0,16	0,18	0,16	0,15	0,18	0,19	0,20	56,98
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
CO_2 emissions from biomass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO_2 captured	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Long-term storage of C in waste disposal sites	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect N_2O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect CO_2 (3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1c

GREENHOUSE GAS SOURCE AND SINK CATEGORIES (N_2O)	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
	Kt										
1. Energy	1,63	1,63	1,69	1,76	2,07	2,33	2,57	2,85	2,76	2,66	2,90
A. Fuel combustion (sectoral approach)	1,63	1,63	1,69	1,75	2,06	2,32	2,56	2,84	2,75	2,65	2,89
1. Energy industries	0,15	0,15	0,16	0,18	0,18	0,18	0,21	0,18	0,19	0,22	0,43
2. Manufacturing industries and construction	0,36	0,36	0,37	0,38	0,38	0,38	0,40	0,40	0,43	0,42	0,42
3. Transport	0,30	0,30	0,32	0,35	0,63	0,88	1,10	1,33	1,33	1,39	1,41
4. Other sectors	0,81	0,81	0,84	0,84	0,87	0,87	0,85	0,92	0,80	0,62	0,63
5. Other	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
B. Fugitive emissions from fuels	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
2. Oil and natural gas and other emissions from energy production	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
C. CO_2 transport and storage	-	-	-	-	-	-	-	-	-	-	-
2. Industrial processes	1,95	1,95	1,83	1,79	1,46	1,24	1,73	1,78	1,84	2,04	1,91
A. Mineral industry	-	-	-	-	-	-	-	-	-	-	-
B. Chemical industry	1,67	1,67	1,55	1,53	1,20	0,99	1,50	1,54	1,60	1,80	1,67
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Non-energy products from fuels and solvent use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Electronic industry	-	-	-	-	-	-	-	-	-	-	-
F. Product uses as ODS substitutes	-	-	-	-	-	-	-	-	-	-	-
G. Other product manufacture and use	0,28	0,28	0,27	0,27	0,26	0,25	0,24	0,24	0,24	0,23	0,23
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
3. Agriculture	8,76	8,76	8,70	8,57	8,52	8,57	8,46	8,93	8,90	8,65	8,81
A. Enteric fermentation	-	-	-	-	-	-	-	-	-	-	-
B. Manure management	0,84	0,84	0,83	0,82	0,82	0,82	0,81	0,81	0,80	0,81	0,85
C. Rice cultivation	-	-	-	-	-	-	-	-	-	-	-
D. Agricultural soils	7,85	7,85	7,80	7,67	7,64	7,69	7,58	8,06	8,03	7,77	7,89
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	0,07	0,07	0,07	0,07	0,07	0,07	0,07	0,07	0,07	0,06	0,06
G. Liming	-	-	-	-	-	-	-	-	-	-	-
H. Urea application	-	-	-	-	-	-	-	-	-	-	-
I. Other carbon containing fertilizers	-	-	-	-	-	-	-	-	-	-	-
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. Land use, land-use change and forestry	1,81	1,81	1,79	1,62	1,55	1,54	1,60	1,50	1,46	1,54	1,48
A. Forest land	0,18	0,18	0,22	0,13	0,13	0,15	0,22	0,15	0,13	0,21	0,17
B. Cropland	1,08	1,08	1,00	0,90	0,81	0,75	0,69	0,61	0,55	0,48	0,45
C. Grassland	0,54	0,54	0,57	0,58	0,60	0,63	0,63	0,63	0,63	0,64	0,60
D. Wetlands	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	IE,NO	0,01	0,02	0,02	0,03	0,04
E. Settlements	0,01	0,01	0,01	0,01	0,01	0,01	0,05	0,08	0,12	0,15	0,19
F. Other land	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,01	0,02	0,02
G. Harvested wood products	-	-	-	-	-	-	-	-	-	-	-
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

5. Waste	1,71	1,71	1,74	1,77	1,80	1,88	1,90	1,87	1,94	2,03	2,06
A. Solid waste disposal	-	-	-	-	-	-	-	-	-	-	-
B. Biological treatment of solid waste	0,03	0,03	0,01	0,02	0,02	0,05	0,06	0,06	0,06	0,06	0,07
C. Incineration and open burning of waste	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
D. Waste water treatment and discharge	1,68	1,68	1,72	1,75	1,78	1,83	1,83	1,81	1,88	1,96	1,99
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total direct N_2O emissions without N_2O from LULUCF	14,06	14,06	13,96	13,90	13,85	14,02	14,66	15,43	15,44	15,37	15,68
Total direct N_2O emissions with N_2O from LULUCF	15,88	15,88	15,75	15,52	15,41	15,56	16,26	16,93	16,91	16,92	17,16
Memo items:											
International bunkers	0,08	0,08	0,08	0,08	0,07	0,07	0,07	0,08	0,08	0,08	0,09
Aviation	0,04	0,04	0,04	0,05	0,04	0,04	0,05	0,05	0,05	0,05	0,05
Navigation	0,04	0,04	0,04	0,04	0,03	0,03	0,03	0,03	0,03	0,03	0,04
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 emissions from biomass	-	-	-	-	-	-	-	-	-	-	-
CO_2 captured	-	-	-	-	-	-	-	-	-	-	-
Long-term storage of C in waste disposal sites	-	-	-	-	-	-	-	-	-	-	-
Indirect N_2O	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO
Indirect CO_2 (3)	-	-	-	-	-	-	-	-	-	-	-

Table 1c (cont.)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES (N_2O)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year
	kt														%
1. Energy	2,20	2,21	2,30	2,17	2,27	2,40	2,34	2,30	2,26	2,12	2,07	1,92	1,80	1,69	3,47
A. Fuel combustion (sectoral approach)	2,19	2,20	2,30	2,16	2,26	2,39	2,33	2,29	2,25	2,11	2,06	1,92	1,79	1,68	3,42
1. Energy industries	0,37	0,38	0,44	0,40	0,48	0,53	0,49	0,47	0,50	0,51	0,45	0,48	0,42	0,33	114,05
2. Manufacturing industries and construction	0,43	0,41	0,41	0,40	0,43	0,43	0,45	0,46	0,45	0,42	0,44	0,30	0,29	0,29	-19,28
3. Transport	0,74	0,73	0,76	0,75	0,75	0,73	0,71	0,70	0,67	0,59	0,60	0,55	0,51	0,48	62,80
4. Other sectors	0,66	0,67	0,69	0,61	0,59	0,70	0,67	0,66	0,62	0,58	0,57	0,58	0,57	0,58	-29,05
5. Other	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-40,25
B. Fugitive emissions from fuels	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	14,00
1. Solid fuels	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
2. Oil and natural gas and other emissions from energy production	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	14,00
C. CO_2 transport and storage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2. Industrial processes	2,04	1,90	1,91	1,98	2,16	2,00	1,95	2,04	1,87	1,13	1,12	0,38	0,35	0,45	-76,79
A. Mineral industry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B. Chemical industry	1,82	1,68	1,69	1,77	1,96	1,81	1,77	1,85	1,68	0,94	0,96	0,22	0,21	0,19	-88,50
C. Metal industry	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
D. Non-energy products from fuels and solvent use	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
E. Electronic industry	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
F. Product uses as ODS substitutes	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
G. Other product manufacture and use	0,22	0,22	0,22	0,22	0,20	0,20	0,18	0,19	0,18	0,18	0,16	0,16	0,14	0,26	-6,47
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
3. Agriculture	9,27	8,93	8,95	7,75	8,00	7,54	7,22	7,71	7,57	7,43	7,40	7,40	7,69	8,05	-8,16
A. Enteric fermentation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B. Manure management	0,87	0,85	0,82	0,78	0,76	0,75	0,73	0,71	0,71	0,72	0,72	0,71	0,70	0,70	-16,70
C. Rice cultivation	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
D. Agricultural soils	8,34	8,02	8,06	6,91	7,18	6,74	6,44	6,95	6,81	6,66	6,63	6,63	6,93	7,30	-7,12
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
F. Field burning of agricultural residues	0,06	0,06	0,06	0,06	0,06	0,06	0,05	0,06	0,05	0,05	0,05	0,06	0,06	0,06	-21,82
G. Liming	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H. Urea application	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
I. Other carbon containing fertilizers	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
4. Land use, land-use change and forestry	1,51	1,45	1,47	1,76	1,43	1,62	1,33	1,22	1,14	1,17	1,22	1,17	1,24	1,23	-32,38
A. Forest land	0,21	0,18	0,22	0,48	0,20	0,42	0,17	0,12	0,10	0,12	0,16	0,11	0,17	0,15	-16,19
B. Cropland	0,43	0,40	0,38	0,39	0,32	0,29	0,25	0,22	0,17	0,17	0,18	0,17	0,18	0,18	-83,18
C. Grassland	0,57	0,52	0,49	0,46	0,41	0,37	0,32	0,27	0,23	0,21	0,19	0,17	0,14	0,12	-77,29
D. Wetlands	0,05	0,06	0,06	0,07	0,08	0,09	0,10	0,10	0,10	0,10	0,10	0,11	0,11	0,11	-
E. Settlements	0,23	0,26	0,30	0,33	0,37	0,41	0,44	0,47	0,49	0,51	0,53	0,56	0,58	0,60	7 659,46

F. Other land	0,03	0,03	0,03	0,04	0,04	0,05	0,05	0,05	0,05	0,05	0,06	0,06	0,06	0,06	2 310,60
G. Harvested wood products	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
H. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
5. Waste	2,09	2,03	2,04	2,18	2,19	2,18	2,14	2,23	2,17	2,08	2,18	2,18	2,04	2,12	23,34
A. Solid waste disposal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B. Biological treatment of solid waste	0,08	0,08	0,03	0,12	0,08	0,07	0,04	0,04	0,05	0,07	0,07	0,05	0,05	0,05	58,29
C. Incineration and open burning of waste	0,00	0,00	0,00	0,00	0,01	0,01	0,02	0,02	0,03	0,03	0,01	0,02	0,01	0,02	429,13
D. Waste water treatment and discharge	2,00	1,94	2,01	2,05	2,10	2,09	2,07	2,16	2,09	1,99	2,10	2,10	1,99	2,05	21,92
E. Other	NO	NO	NO	NO	NO	0,00	0,00	0,00	0,00	0,00	0,00	0,00	NO	NO	-
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
Total direct N_2O emissions without N_2O from LULUCF	15,60	15,06	15,21	14,08	14,62	14,12	13,65	14,28	13,87	12,76	12,76	11,88	11,89	12,31	-12,47
Total direct N_2O emissions with N_2O from LULUCF	17,11	16,51	16,68	15,84	16,05	15,74	14,97	15,50	15,01	13,93	13,98	13,06	13,12	13,53	-14,75
Memo items:															
International bunkers	0,10	0,08	0,08	0,10	0,11	0,10	0,11	0,12	0,13	0,11	0,12	0,13	0,13	0,14	75,04
Aviation	0,06	0,05	0,05	0,06	0,06	0,06	0,07	0,07	0,07	0,07	0,07	0,08	0,08	0,08	91,00
Navigation	0,04	0,03	0,03	0,04	0,05	0,04	0,04	0,05	0,05	0,05	0,04	0,05	0,05	0,06	56,98
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
CO_2 emissions from biomass	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CO_2 captured	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Long-term storage of C in waste disposal sites	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indirect N_2O	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	-
Indirect CO_2 (3)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 1d

GREENHOUSE GAS SOURCE AND SINK CATEGORIES (HFCs, PFCs, SF_6, and NF_3)	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
	kt											
Emissions of HFCs and PFCs - (kt CO_2 equivalent)	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	30,65	48,91	71,47	100,63	185,93	288,45
Emissions of HFCs - (kt CO_2 equivalent)	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	30,65	48,91	71,47	100,63	185,93	288,45
HFC-23	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NO	NO	NO	0,00	0,00
HFC-32	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	IE,NO	IE,NO	IE,NO	IE,NO	0,00	0,01
HFC-41	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-43-10mee	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-125	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	IE,NO	0,00	0,00	0,00	0,01	0,02
HFC-134	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-134a	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	0,02	0,03	0,04	0,06	0,08	0,10
HFC-143	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-143a	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	NA,NE,NO	IE,NO	0,00	0,00	0,00	0,00	0,01
HFC-152	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-152a	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	0,01	0,01	0,02	0,04	0,06	0,09
HFC-161	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-227ea	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	0,00	0,00	0,00	0,00	0,00	0,00
HFC-236cb	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-236ea	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-236fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-245ca	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-245fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-365mfc	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of HFCs(4) - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of PFCs - (kt CO_2 equivalent)	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NO	NO	NO	NO	NO
CF_4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_2F_6	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NO	NO	NO	NO	NO
C_3F_8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_4F_{10}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
c-C_4F_8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_5F_{12}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C_6F_{14}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
C10F18	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
c-C3F6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of PFCs(4) - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of HFCs and PFCs - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of SF_6 - (kt CO_2 equivalent)	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	14,62	15,12	16,87	17,38	18,39	18,43
SF_6	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	0,00	0,00	0,00	0,00	0,00	0,00
Emissions of NF3 - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Table 1d (cont.)

GREENHOUSE GAS SOURCE AND SINK CATEGORIES (HFCs, PFCs, SF_6, and NF_3)	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year (%)
	kt													
Emissions of HFCs and PFCs - (kt CO_2 equivalent)	374,38	484,32	618,25	733,36	841,36	955,12	1 105,22	1 266,58	1 380,45	1 508,24	1 612,01	1 737,41	1 727,83	-
Emissions of HFCs - (kt CO_2 equivalent)	374,38	484,32	618,25	733,36	841,36	954,98	1 105,22	1 266,58	1 380,44	1 508,23	1 612,00	1 737,40	1 727,82	-
HFC-23	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-
HFC-32	0,02	0,03	0,04	0,05	0,05	0,06	0,06	0,07	0,08	0,08	0,09	0,11	0,10	-
HFC-41	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-43-10mee	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-125	0,03	0,04	0,05	0,07	0,08	0,09	0,10	0,12	0,13	0,14	0,15	0,17	0,16	-
HFC-134	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-134a	0,12	0,15	0,19	0,22	0,26	0,29	0,33	0,36	0,39	0,44	0,48	0,51	0,51	-
HFC-143	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-143a	0,01	0,02	0,02	0,02	0,03	0,03	0,04	0,05	0,06	0,07	0,07	0,07	0,07	-
HFC-152	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-152a	0,12	0,14	0,28	0,30	0,30	0,30	0,30	0,29	0,28	0,29	0,28	0,27	0,27	-
HFC-161	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-227ea	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-
HFC-236cb	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-236ea	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-236fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-245ca	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-245fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
HFC-365mfc	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
Unspecified mix of HFCs(4) - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
Emissions of PFCs - (kt CO_2 equivalent)	NO	NO	NO	NO	0,00	0,13	0,01	0,01	0,01	0,01	0,01	0,01	0,01	-
CF_4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
C_2F_6	NO	NO	NO	NO	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-
C_3F_8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
C_4F_{10}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
c-C_4F_8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
C_5F_{12}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
C_6F_{14}	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
C10F18	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
c-C3F6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
Unspecified mix of PFCs(4) - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
Unspecified mix of HFCs and PFCs - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
Emissions of SF_6 - (kt CO_2 equivalent)	20,29	19,84	26,18	35,21	35,50	37,09	45,75	44,52	49,57	52,08	48,58	52,68	55,25	-
SF_6	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-
Emissions of NF3 - (kt CO_2 equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-

Table 1e

GREENHOUSE GAS EMISSIONS	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Kt CO_2eq												
CO_2 emissions without net CO_2 from LULUCF	44 896,42	44 896,42	46 536,77	50 767,20	49 432,14	50 090,68	54 105,06	51 478,46	54 317,10	58 833,38	66 530,60	65 355,02	65 061,56
CO_2 emissions with net CO_2 from LULUCF	45 933,37	45 933,37	47 527,30	47 153,11	44 687,68	44 614,51	48 846,96	42 510,92	44 443,63	51 113,57	57 772,06	58 741,25	55 092,08
CH_4 emissions without CH_4 from LULUCF	11 339,18	11 339,18	11 594,39	11 784,81	11 812,75	12 248,47	12 602,33	12 567,44	12 763,17	13 210,37	13 425,70	13 290,73	13 561,55
CH_4 emissions with CH_4 from LULUCF	11 544,25	11 544,25	11 870,86	11 872,89	11 888,00	12 368,75	12 858,73	12 664,45	12 802,35	13 415,42	13 532,32	13 475,69	13 672,42
N_2O emissions without N_2O from LULUCF	4 190,03	4 190,03	4 160,87	4 141,59	4 127,97	4 179,03	4 369,04	4 597,95	4 602,55	4 581,71	4 673,11	4 649,02	4 486,76
N_2O emissions with N_2O from LULUCF	4 730,84	4 730,84	4 694,47	4 625,41	4 590,78	4 637,08	4 846,46	5 046,31	5 038,50	5 041,91	5 113,22	5 098,03	4 919,67
HFCs	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	NE,NA,NO	30,65	48,91	71,47	100,63	185,93	288,45	374,38
PFCs	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of HFCs and PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
SF_6	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	NE,NO	14,62	15,12	16,87	17,38	18,39	18,43	20,29
NF3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (without LULUCF)	60 425,62	60 425,62	62 292,03	66 693,60	65 372,87	66 518,18	71 121,70	68 707,88	71 771,17	76 743,46	84 833,72	83 601,66	83 504,54
Total (with LULUCF)	62 208,46	62 208,46	64 092,63	63 651,41	61 166,46	61 620,34	66 597,41	60 285,71	62 372,83	69 688,91	76 621,92	77 621,85	74 078,86
Total (without LULUCF, with indirect)	60 723,71	60 723,71	62 587,02	66 991,11	65 661,94	66 816,73	71 415,50	69 012,93	72 089,90	77 063,15	85 159,22	83 931,81	83 801,47
Total (with LULUCF, with indirect)	62 506,55	62 506,55	64 387,62	63 948,92	61 455,53	61 918,89	66 891,21	60 590,76	62 691,55	70 008,60	76 947,42	77 952,00	74 375,78

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year[a]	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Kt CO_2eq												
1. Energy	41 388,39	41 388,39	42 926,62	47 467,92	46 212,82	46 870,67	50 408,78	47 752,61	50 381,30	54 872,51	62 325,61	60 770,16	61 193,87
2. Industrial processes and product use	5 246,32	5 246,32	5 310,04	5 008,51	4 911,85	4 906,49	5 615,82	5 737,37	6 009,40	6 175,59	6 582,60	6 861,40	6 544,49
3. Agriculture	7 573,37	7 573,37	7 652,31	7 579,82	7 442,38	7 605,66	7 733,85	7 888,35	7 800,77	7 831,32	7 993,02	8 143,63	7 893,97
4. Land Use, Land-Use Change and Forestry[b]	1 782,84	1 782,84	1 800,60	-3 042,19	-4 206,41	-4 897,84	-4 524,29	-8 422,17	-9 398,34	-7 054,55	-8 211,80	-5 979,80	-9 425,69
5. Waste	6 217,55	6 217,55	6 403,07	6 637,35	6 805,82	7 135,36	7 363,24	7 329,55	7 579,70	7 864,05	7 932,49	7 826,46	7 872,21
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (including LULUCF)	62 208,46	62 208,46	64 092,63	63 651,41	61 166,46	61 620,34	66 597,41	60 285,71	62 372,83	69 688,91	76 621,92	77 621,85	74 078,86

Table 1e (cont.)

GREENHOUSE GAS EMISSIONS	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year (%)
	Kt CO_2eq												
CO_2 emissions without net CO_2 from LULUCF	68 805,94	63 647,02	66 291,22	68 816,33	64 250,55	61 565,95	59 486,09	56 724,15	52 204,49	50 918,55	49 146,43	47 408,47	5,60
CO_2 emissions with net CO_2 from LULUCF	59 254,32	63 980,73	57 625,09	68 123,89	54 645,75	48 472,39	44 988,89	42 340,50	40 297,89	36 819,54	38 448,79	37 499,68	-18,36
CH_4 emissions without CH_4 from LULUCF	13 811,33	14 021,90	13 991,63	13 997,14	13 517,76	13 342,75	13 129,70	13 077,00	12 770,64	12 823,40	12 476,64	12 212,58	7,70
CH_4 emissions with CH_4 from LULUCF	13 983,21	14 739,22	14 130,31	14 555,01	13 620,54	13 384,39	13 150,86	13 134,07	12 922,34	12 884,25	12 650,92	12 366,12	7,12
N_2O emissions without N_2O from LULUCF	4 532,16	4 195,88	4 356,67	4 207,85	4 066,67	4 255,27	4 133,69	3 803,64	3 803,55	3 541,60	3 542,77	3 667,32	-12,47
N_2O emissions with N_2O from LULUCF	4 971,13	4 720,31	4 782,33	4 690,06	4 462,14	4 619,93	4 474,20	4 150,85	4 167,08	3 890,86	3 911,24	4 033,01	-14,75
HFCs	484,32	618,25	733,36	841,36	954,98	1 105,22	1 266,58	1 380,44	1 508,23	1 612,00	1 737,40	1 727,82	-
PFCs	NO	NO	NO	0,00	0,13	0,01	0,01	0,01	0,01	0,01	0,01	0,01	-
Unspecified mix of HFCs and PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
SF_6	19,84	26,18	35,21	35,50	37,09	45,75	44,52	49,57	52,08	48,58	52,68	55,25	-
NF3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
Total (without LULUCF)	87 653,59	82 509,23	85 408,08	87 898,18	82 827,19	80 314,94	78 060,58	75 034,82	70 338,99	68 944,15	66 955,92	65 071,46	7,69
Total (with LULUCF)	78 712,82	84 084,69	77 306,30	88 245,81	73 720,64	67 627,68	63 925,06	61 055,44	58 947,63	55 255,25	56 801,04	55 681,89	-10,49
Total (without LULUCF, with indirect)	87 936,94	82 785,94	85 683,65	88 167,23	83 097,00	80 588,05	78 323,51	75 275,70	70 588,68	69 182,53	67 188,85	65 307,62	7,55
Total (with LULUCF, with indirect)	78 996,18	84 361,41	77 581,86	88 514,87	73 990,45	67 900,80	64 187,99	61 296,33	59 197,31	55 493,63	57 033,97	55 918,05	-10,54

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Change from base to latest reported year (%)
	Kt CO_2eq												
1. Energy	64 875,35	59 825,67	61 808,24	64 396,11	59 765,01	56 677,89	55 040,97	53 987,86	48 936,23	48 075,74	46 426,27	44 473,76	7,45
2. Industrial processes and product use	6 856,97	6 889,53	7 506,62	7 526,80	7 332,13	7 929,42	7 869,03	6 222,34	6 466,69	5 712,97	5 656,36	5 862,26	11,74
3. Agriculture	7 746,19	7 256,51	7 436,92	7 335,53	7 232,15	7 325,25	7 303,42	7 139,72	7 058,06	7 017,07	7 081,92	7 132,85	-5,82
4. LULUCF	-8 940,76	1 575,47	-8 101,78	347,63	-9 106,55	-12 687,26	-14 135,53	-13 979,37	-11 391,37	-13 688,90	-10 154,88	-9 389,57	-626,66
5. Waste	8 175,08	8 537,52	8 656,31	8 639,73	8 497,90	8 382,38	7 847,16	7 684,90	7 878,01	8 138,36	7 791,37	7 602,59	22,28
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	-
Total (including LULUCF)	78 712,82	84 084,69	77 306,30	88 245,81	73 720,64	67 627,68	63 925,06	61 055,44	58 947,63	55 255,25	56 801,04	55 681,89	-10,49

Table 2 (a) Description of quantified economy-wide emission reduction target

Base year/ base period	1990
Emission reductions target (% of base year/base period)	-
Emission reductions target (% of 1990)	20.00
Period for reaching target	BY-2020

Table 2 (b) Description of quantified economy-wide emission reduction target

Gases covered	Covered	Base Year	GWP reference source
CO_2	Yes	1990	4th AR
CH_4	Yes	1990	4th AR
N_2O	Yes	1990	4th AR
HFCs	Yes	1990	4th AR
PFCs	Yes	1990	4th AR
SF_6	Yes	1990	4th AR
NF_3	No		4th AR
Other Specify			

Table 2 (c) Description of quantified economy-wide emission reduction target

Sectors covered	Covered
Energy	Yes
Transport[f]	Yes
Industrial processes[g]	Yes
Agriculture	Yes
LULUCF	No
Waste	Yes
Other Specify	
Aviation in the scope of the EU-ETS	Yes

Table 2 (d) Description of quantified economy-wide emission reduction target

Role of LULUCF sector	
LULUCF in base year level and target	Excluded
Contribution of LULUCF is calculated using	-

Table 2 (e)I Description of quantified economy-wide emission reduction target

Market-based mechanisms under the Convention		Comments
Possible scale of contributions of market-based mechanisms under the Convention (estimated kt CO_2 eq)		The 2020 Climate and Energy Package allows Certified Emission Reductions (CERs) and Emission Reduction Units (ERUs) to be used for compliance purposes, subject to a number of restrictions in terms of origin and type of project and up to an established limit. In addition, the legislation foresees the possible recognition of units from new market mechanisms. Under the EU ETS the limit does not exceed 50% of the required reduction below 2005 levels. In the sectors not covered by the ETS, annual use shall not exceed to 3 % of each Member States' non-ETS greenhouse gas emissions in 2005. A limited number of Member States may use an additional 1%, from projects in LDCs or SIDS subject to conditions.
CERs		The use of these units under the ETS Directive and the Effort Sharing Decision is subject to the limits specified above which do not separate between CERs and ERUs, but include additional criteria for the use of CERs.
ERUs		The use of these units under the ETS Directive and the Effort Sharing Decision is subject to the limits specified above which do not separate between CERs and ERUs, but include additional criteria for the use of CERs.
AAUs[i]		AAUs for the period 2013-2020 have not yet been determined. The EU expects to achieve its 20% target for the period 2013-2020 with the implementation of the ETS Directive and the ESD Decision in the non-ETS sectors which do not allow the use of AAUs from non-EU Parties.
Carry-over units[j]		The time-period of the Convention target is from 1990-2020, no carry-over units will be used to achieve the 2020 target.
Other mechanism units under the Convention (specify)[k]		There are general provisions in place in the EU legislation that allow for the use of such units provided that the necessary legal arrangements for the creation of such units have been put in place in the EU which is not the case at the point in time of the provision of this report.

Table 2 (e)II Description of quantified economy-wide emission reduction target

Other market-based mechanisms		
Possible scale of contributions of other market-based mechanisms (estimated kt CO_2 eq)		

Table 2 (f) Description of quantified economy-wide emission reduction target

Any other information	In December 2009, the European Council reiterated the conditional offer of the EU to move to a 30% reduction by 2020 compared to 1990 levels as part of a global and comprehensive agreement for the period beyond 2012, provided that other developed countries commit themselves to comparable emissions reductions and that developing countries contribute adequately according to their responsibilities and respective capabilities.

Table 3: Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

										Mitigation impact	
Name of mitigation action	Included in with measures GHG projection scenario	Sectors affected	GHGs affected	Objective and/or activity affected	Type of instrument	Status of implementation	Brief description	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative) (kt CO_2 eq)	2020
Reducing GHG Emissions in the Waste Sector	Yes	Waste management/waste	CH_4, CO_2	Waste incineration with energy use; Improved landfill management, treatment technologies and wastewater management systems.	Economic|Regulatory|Other (Planning)	Implemented	Reducing the emissions of the waste sector through a variety of actions including: -Recycling; -Reducing organic waste landfill deposition; -Definition of a GHG emission reduction target for 2020 and corresponding intermediate targets; -Green taxation reform including changes in the waste management tax and introduction of a fee on lightweight plastic bags; -Promoting the substitution of fossil fuels by Fuel Derived from Waste (CDR) produced from municipal waste; -Promoting the use of compost produced by the treatment of municipal waste; -Increased recovery and use of biogas in municipal waste treatment facilities; -Promoting the use of biofuels from used cooking oils; -Limit waste production through an absolute decrease of the amount of waste produced in relation to a reference level (waste prevention actions targeted to industry, services and consumers).	2014	Portuguese Environment Agency (APA)	kt CO_2 eq	6,900.00
Phasing Out Fuel Oil Co-generation	Yes	Energy	CO_2	Efficiency improvement in industrial end-use sectors.	Other (Regulatory)	Adopted	Improved wastewater management systems.	2010	General-Directorate for Economic Activities (DGAEP)	kt CO_2 eq	
Management of Livestock Effluents and Waste	Yes	Waste management/ waste	CH_4, CO_2	Improved animal waste management systems.	Regulatory	Planned	The main purpose is to reduce the carbon intensity of management practices of livestock effluents and waste.	2007	APA	kt CO_2 eq	
Emission Reduction from the Nitrogen Fertilizers	Yes	Agriculture	CH_4, N_2O	Reduction of fertilizer/manure use on cropland.	Other (Regulatory)	Planned	The main purpose is to promote the reduction of N2O emissions from fertilization practices of agricultural land.	2014	Portuguese Cabinet for Planning and Policies	kt CO_2 eq	
Energy Efficiency in the Public Administration Sector	Yes	Energy, Transport	CO_2	Efficiency improvements in services/ tertiary sector and buildings; Demand management/reduction; Efficiency improvements of vehicles.	Regulatory	Implemented	Promoting energy efficiency measures targeting the Public Administration: - Energy certification of State buildings and energy efficiency management contracts; - Action Plan for Energy Efficiency in Public Administration (ECO.AP); - More efficient public administration transport; - Efficient public lighting.	2013		kt CO_2 eq	
Energy Efficiency in Commercial and Residential Buildings	Yes	Energy	CO_2	Efficiency improvements of appliances, buildings and services/ tertiary sector; Demand management/ reduction.	Other (Regulatory)	Implemented	Promoting energy efficiency in commercial and residential buildings: - Promoting more efficient equipment Efficient lighting; - Efficient Windows; - Insulation; - Green heat; - Energy certification system for commercial and residential buildings; - Promotion of thermal solar energy in commercial and residential buildings.	2013	Directorate-General for Energy and Geology (DGEG)	kt CO_2 eq	1.098.072,00
Renewables: Heating and Cooling	Yes	Energy	CO_2	Increase in renewable energy; Enhanced non-renewable low carbon generation (nuclear).	Other (Regulatory)	Implemented	Measures promoting of renewables: - Thermal solar energy - Green heat - Registration of installers of small renewable systems.	2013	DGEG	kt CO_2 eq	
Renewables: Electricity	Yes	Energy	CO_2	Increase in renewable energy; Switch to less carbon-intensive fuels; Efficiency improvement in the energy and transformation sector.	Regulatory|Economic|Information|Other (Planning)	Implemented	Promoting renewables in the electricity sector: - Introduction of a general remuneration regime Operationalisation of the market facilitator role; - Operationalisation of Origin Guarantees; - Biomass power plants (decentralised network); - Mini-generation and own consumption regime; - One stop shop electricity National Dam Plan including reinforcement of capacity and installation of pumping systems; - Offshore energy pilot zone; - Over-equipment for wind farms.	2013	DGEG	kt CO_2 eq	

Biofuels	Yes	Energy, Transport	CO_2	Increase in renewable energy; Switch to less carbon-intensive fuels; Low carbon fuels/electric cars.	Regulatory	Implemented	Promotion of the use of biofuels.	2013	DGEG	kt CO_2 eq	
Energy Efficiency in the Transport Sector	Yes	Transport	CO_2		Regulatory|Fiscal|Economic|Voluntary Agreement	Implemented	Promoting energy efficiency measures in the transport sector: - Revision of the taxation regime for private vehicles; - Green tire; - Promotion of sustainable mobility and good practices; - Use of more energy efficient transports and mobility solutions; - Promoting rail passenger transport; - Regulation for management of energy consumptions in transport; - Promoting nitrogen tire filling stations; - Fleet management system and promoting eco-driving.	2013		kt CO_2 eq	
Energy Efficiency in Industry	Yes	Energy, Industry/ industrial processes	CO_2	Efficiency improvement in industrial end-use sectors.	Regulatory	Implemented	Promoting energy efficiency measures in industry through the energy consumption management system for intensive energy users (SGCIE).	2013	DGEG	kt CO_2 eq	521.309.00
Reducing Energy Intensity of the Agriculture Sector	Yes	Energy, Agriculture	CO_2	Demand management/reduction; Efficiency improvement in industrial end-use sectors.	Other (Regulatory)	Adopted	Promotion of energy efficiency and renewable in the agriculture sector.	2013	Ministry of Agriculture and Sea (MAM)	kt CO_2 eq	
Carbon Tax	Yes	Cross-cutting, Transport, Energy	CO_2	Multi-sectoral policy; Demand management/reduction.	Fiscal	Implemented	Carbon tax on non-ETS sectors linked to ETS allowances average price in the previous year.	2015	Ministry of Environment, Spatial Planning and Energy; (MAOTE) Ministry of Finance (MF).	kt CO_2 eq	
Vehicle Scrappage Scheme	Yes	Transport	CO_2	Efficiency improvements of vehicles; Low carbon fuels/electric cars.	Fiscal	Implemented	Fiscal incentives for purchase of new cars (plug-in hybrids or electric) and scrap an old one.	2015		kt CO_2 eq	
CO2 Component on Motor Vehicles Taxes	Yes	Transport	CO_2	Efficiency improvements of vehicles; Low carbon fuels/electric cars.	Fiscal	Implemented	Positive discrimination on motor vehicles taxes: - CO2 component on registration tax; - CO2 component on the annual circulation tax; - exemption of registration and annual circulation taxes for electric vehicles.	2007		kt CO_2 eq	
Forest Fires Prevention	Yes	Forestry/ LULUCF	CO_2	Enhanced forest management; Strengthening protection against natural disturbances; Conservation of carbon in existing forests.	Other (Planning)	Implemented	Reducing the number of fires, the burnt area and the emissions from fires through implementation of fire prevention actions.	2014	MAM	kt CO_2 eq	
Promoting Carbon Sequestration in Forest Land	Yes	Forestry/ LULUCF	CO_2	Afforestation and reforestation; Conservation of carbon in existing forests; Enhancing production in existing forests; Enhanced forest management; Restoration of degraded lands.	Other (Regulatory)	Implemented	Increase forest area by planting agricultural land, non-agricultural land and areas prone to desertification. It also aims at improving the conservation and condition of forest habitats, riparian corridors and other NATURA 2000 areas and to improve the management standards of existing forests.	2014	MAM	kt CO_2 eq	
Reducing Emissions or Increasing Sequestration in Soils	Yes	Forestry/ LULUCF	CO_2	Restoration of degraded lands.	Other (Voluntary Agreement)	Implemented	Promote climate friendly soil management practices and their use by the farmer's community.	2014	MAM	kt CO_2 eq	
Promoting the Substitution Effect of Forest Products	Yes	Energy, Forestry/ LULUCF	CO_2, CH_4, N_2O	Increase in renewable energy; Substitution of GHG-intensive feedstocks and materials with harvested wood products; Increasing the harvested wood products pool.	Other (Planning)	Implemented	Promote the use of biomass for energy through the establishment of short rotation biomass production and to promote the substitution of fossil based raw materials with forest products.	2014	MAM	kt CO_2 eq	

Tax Incentives for Efficiency and Low Carbon Options	Yes	Transport, Energy	CO_2	Switch to less carbon-intensive fuels; Efficiency improvements of vehicles; Low carbon fuels/electric cars.	Fiscal	Implemented	Tax incentives for: - Plug-in hybrid and LPG/NGV; - Renewables in urban buildings; - Car-sharing/bike-sharing systems; - Velocipede fleets.	2015	MF	kt CO_2 eq	
Emissions Trading Scheme	Yes	Industry/industrial processes, Transport, Other (Energy Supply and Consumption)	CO_2, N_2O	Switch to less carbon-intensive fuels; Efficiency improvement in the energy and transformation sector; Installation of abatement technologies; Increase in renewable energy; Efficiency improvement in industrial end-use sectors; Demand management/reduction; Other industrial processes.	Other (Economic)	Implemented	Implementation of the EU ETS - Industrial installations and aviation.	2005	APA & National Authority for Civil Aviation	kt CO_2 eq	
F-Gas Regulation	Yes	Industry/ industrial processes	HFCs, PFCs, SF_6	Reduction of emissions of fluorinated gases; Replacement of fluorinated gases by other substances.	Regulatory	Implemented	Implementation of the F-gas Regulation 517/2014.	2014	APA	kt CO_2 eq	
Regulation on CO2 for Cars and Vans	Yes	Transport	CO_2	Efficiency improvements of vehicles.	Regulatory	Implemented	Implementation of the Regulation 2009/443/EC of the European Parliament and the Council of 23 April; Implementation of the Regulation 2011/510/EC of the European Parliament and the Council of 11 May.	2009		kt CO_2 eq	
Promotion of Electric Mobility	Yes	Transport	CO_2	Low carbon fuels/electric cars; Efficiency improvements of vehicles.	Regulatory| Economic| Other (Planning)	Implemented	Mobi.E (charging infrastructure) Electric mobility management structure.	2009	MAOTE	kt CO_2 eq	
Taxation of Energy Products	Yes	Energy	CH_4, CO_2	Efficiency improvements of buildings and services/ tertiary sector.	Fiscal	Adopted	Changes in the Portuguese tax burden on heating oil.	2007	DGAEP; DGEG; MF	kt CO_2 eq	
Regulation for Intensive Energy Users	Yes	Energy	CO_2	Efficiency improvement in industrial end-use sectors.	Regulatory	Adopted	Implementation of a new regulation for intensive energy user's regulation (RGCE) to promote energy efficiency in the industrial sector through voluntary agreements.	2008	DGEG	kt CO_2 eq	
Green Fiscal Reform	Yes	Energy, Cross-cutting, Transport		Multi-sectoral policy; Demand management/ reduction; Efficiency improvements of vehicles; Low carbon fuels/ electric cars; Switch to less carbon-intensive fuels.	Fiscal	Implemented	Green Fiscal Reform measures adopted in 2014 and entering into force in 2015 including a carbon tax and incentives for electric mobility.	2015	MAOTE; MF; Portuguese Carbon Fund/ APA; Institute for Mobility and Transport.	kt CO_2 eq	
Energy Efficiency Action Plan	Yes	Energy, Transport, Agriculture	CO_2	Efficiency improvements in services/ tertiary sector, appliances and buildings; Demand management/ reduction; Efficiency improvements of vehicles; Low carbon fuels/ electric cars; Improved behaviour; Demand management/ reduction; Improved transport infrastructure; Efficiency improvement in industrial end-use sectors.	Regulatory|Economic | Fiscal|Voluntary Agreement	Implemented	Measures included in the national energy efficiency action plan.	2013	DGEG; MAM	kt CO_2 eq	
Renewable Energy Action Plan	Yes	Energy, Transport	CO_2	Increase in renewable energy; Enhanced non-renewable low carbon generation (nuclear); Switch to less carbon-intensive fuels; Efficiency improvement in the energy and transformation sector; Low carbon fuels/ electric cars.	Economic|Regulatory|Information	Implemented	Measures included in the national renewable energy action plan.	2013	DGEG.	kt CO_2 eq	

Table 4: Report on progress

	Unit	Base Year	2010	2011	2012	2013	2014
Total (without LULUCF)	kt CO_2 eq	60 425.62	70 338.99	68 944.15	66 955.92	65 071.46	-
Contribution from LULUCF [c] 1)	kt CO_2 eq	-	-	-	-	-	-
Market-based mechanisms under the Convention 2)	number of units	-	-	-	-	-	-
	kt CO_2 eq	-	-	-	-	-	-
Other market-based mechanisms 3)	number of units	-	-	-	-	-	-
	kt CO_2 eq	-	-	-	-	-	-

1) Numbers for LULUCF are not reported because this sector is not included under the Convention target of the EU.

2) Market-based mechanism under the Convention: Not applicable: Use of CER and ERU cannot be quantified at the time of reporting.

3) No "other" market-based mechanisms are in use.

Table 4(a)I: Progress in achieving the quantified economy-wide emission reduction targets – further information on mitigation actions relevant to the contribution of the land use, land-use change and forestry sector

	Unit	Net GHG emissions/removals from LULUCF categories	Base year/period or reference level value	Contribution from LULUCF for reported year	Cumulative contribution from LULUCF	Accounting approach
2013						
Total LULUCF	kt CO_2 eq	-9 389.57	-	-	-	-
A. Forest land	kt CO_2 eq	-12 442.94	-	-	-	-
1. Forest land remaining forest land	kt CO_2 eq	-8 742.96	-	-	-	-
2. Land converted to forest land	kt CO_2 eq	-3 699.98	-	-	-	-
3. Other [g]	kt CO_2 eq	-	-	-	-	-
B. Cropland	kt CO_2 eq	673.84	-	-	-	-
1. Cropland remaining cropland	kt CO_2 eq	-191.71	-	-	-	-
2. Land converted to cropland	kt CO_2 eq	865.55	-	-	-	-
3. Other [g]	kt CO_2 eq	-	-	-	-	-
C. Grassland	kt CO_2 eq	345.21	-	-	-	-
1. Grassland remaining grassland	kt CO_2 eq	-267.59	-	-	-	-
2. Land converted to grassland	kt CO_2 eq	612.80	-	-	-	-
3. Other [g]	kt CO_2 eq	-	-	-	-	-
D. Wetlands	kt CO_2 eq	442.93	-	-	-	-
1. Wetland remaining wetland	kt CO_2 eq	-	-	-	-	-
2. Land converted to wetland	kt CO_2 eq	442.93	-	-	-	-
3. Other [g]	kt CO_2 eq	-	-	-	-	-
E. Settlements	kt CO_2 eq	2 607.05	-	-	-	-
1. Settlements remaining settlements	kt CO_2 eq	-	-	-	-	-
2. Land converted to settlements	kt CO_2 eq	2 607.05	-	-	-	-
3. Other [g]	kt CO_2 eq	v	-	-	-	-
F. Other land	kt CO_2 eq	-1 235.66	-	-	-	-
1. Other land remaining other land	kt CO_2 eq	-	-	-	-	-
2. Land converted to other land	kt CO_2 eq	-1 235.66	-	-	-	-
3. Other [g]	kt CO_2 eq	-	-	-	-	-
Harvested wood products	kt CO_2 eq	220.00	-	-	-	-
2014						
Total LULUCF	kt CO_2 eq		-	-	-	-
A. Forest land	kt CO_2 eq	-	-	-	-	-
1. Forest land remaining forest land	kt CO_2 eq	-	-	-	-	-
2. Land converted to forest land	kt CO_2 eq	-	-	-	-	-

3. Other [g]	kt CO_2 eq	-	-	-	-	-
B. Cropland	kt CO_2 eq	-	-	-	-	-
1. Cropland remaining cropland	kt CO_2 eq	-	-	-	-	-
2. Land converted to cropland	kt CO_2 eq	-	-	-	-	-
3. Other [g]	kt CO_2 eq	-	-	-	-	-
C. Grassland	kt CO_2 eq	-	-	-	-	-
1. Grassland remaining grassland	kt CO_2 eq	-	-	-	-	-
2. Land converted to grassland	kt CO_2 eq	-	-	-	-	-
3. Other [g]	kt CO_2 eq	-	-	-	-	-
D. Wetlands	kt CO_2 eq	-	-	-	-	-
1. Wetland remaining wetland	kt CO_2 eq	-	-	-	-	-
2. Land converted to wetland	kt CO_2 eq	-	-	-	-	-
3. Other [g]	kt CO_2 eq	-	-	-	-	-
E. Settlements	kt CO_2 eq	-	-	-	-	-
1. Settlements remaining settlements	kt CO_2 eq	-	-	-	-	-
2. Land converted to settlements	kt CO_2 eq	-	-	-	-	-
3. Other [g]	kt CO_2 eq	-	-	-	-	-
F. Other land	kt CO_2 eq	-	-	-	-	-
1. Other land remaining other land	kt CO_2 eq	-	-	-	-	-
2. Land converted to other land	kt CO_2 eq	-	-	-	-	-
3. Other [g]	kt CO_2 eq	-	-	-	-	-
Harvested wood products	kt CO_2 eq	-	-	-	-	-

Table 4(b). Reporting on progress

	Quantity of units	kt CO_2 eq
2013		
Kyoto Protocol Units [d]		
AAUs		
ERUs		
CERs		
tCERs		
lCERs		
Units from market-based mechanisms under the Convention [d, e]		
Units from other market-based mechanisms [d, e]		
Total		
2014		
Kyoto Protocol Units [d]		
AAUs		
ERUs		
CERs		
tCERs		
lCERs		
Units from market-based mechanisms under the Convention [d, e]		
Units from other market-based mechanisms [d, e]		
Total		

Table 5: Summary of key variables and assumptions used in the projections analysis

Key underlying assumptions	Unit	Historical					Projected				
		1990	1995	2000	2005	2010	2011	2015	2020	2025	2030
Population	thousands	9,983.20	10,026.20	10,289.90	10,503.00	10,573.10	10,557.10	10,551.75	10,565.71	10,579.36	10,677.17
Population growth	%	-	0.43	2.63	2.07	0.66	-0.15	-0.20	-0.07	0.05	0.98
GDP growth rate	thousands	115 329.39	125 220.57	154 140.27	160 626.88	165,103.40	163 014.11	154,783.86	171,600.47	198,931.98	230,616.69
GDP growth rate	%	-	1.95	4.20	0.80	0.60	-	1.50	3.00	3.00	3.00
International oil price	USD / boe	-	-	-	-	-	-	-	89.00	85.71	93.00
International coal price	USD / boe	-	-	-	-	-	-	-	23.00	22.62	24.00
International gas price	USD / boe	-	-	-	-	-	-	-	62.00	55.71	65.00

Table 6: Information on updated greenhouse gas projections

GHG emissions projections	Unit	GHG emissions and removals							GHG emission projections - Scenarios			
									With measures		With additional measures	
		Base year	1990	1995	2000	2005	2010	2013	2020	2030	2020	2030
Sector												
Energy	kt CO_2 eq	41,388.39	41,388.39	50,408.78	60,770.16	64,396.12	48,936.23	44,473.76	40,051.23	35,648.65	40,051.16	33,008.42
Transport	kt CO_2 eq	10,019.67	10,019.67	13,336.96	18,968.45	19,400.62	18,538.48	15,464.65	15,044.49	14,746.65	15,044.49	14,736.93
Industry/industrial processes	kt CO_2 eq	5,246.32	5,246.32	5,615.82	6,861.40	7,526.80	6,466.69	5,862.26	6,588.42	5,969.82	6,449.66	4,978.92
Agriculture	kt CO_2 eq	7,573.37	7,573.37	7,733.85	8,143.63	7,335.53	7,058.06	7,132.85	8,142.39	7,241.39	8,142.39	7,241.39
Forestry/LULUCF	kt CO_2 eq	1,782.84	1,782.84	-4,524.29	-5,979.80	347.64	-11,391.37	-9,389.57	-7,567.04	-8,316.48	-7,567.04	-8,316.48
Waste management/waste	kt CO_2 eq	6,217.55	6,217.55	7,363.24	7,826.46	8,639.73	7,878.01	7,602.59	8,266.53	6,987.25	8,267.47	6,827.43
Other Sectors												
Gases												
CO_2 emissions including net CO_2 from LULUCF	kt CO_2 eq	45,933.37	45,933.37	48,846.96	58,741.25	68,123.89	40,297.89	37,499.68	34,530.87	29,870.92	34,430.45	27,232.68
CO_2 emissions excluding net CO_2 from LULUCF	kt CO_2 eq	44,896.42	44,896.42	54,105.06	65,355.02	68,816.33	52,204.49	47,408.47	42,242.87	38,332.36	42,142.45	35,694.12
CH_4 emissions including CH_4 from LULUCF	kt CO_2 eq	11,544.25	11,544.25	12,858.73	13,475.69	14,555.01	12,922.34	12,366.12	13,267.04	11,196.99	13,266.96	10,985.29
CH_4 emissions excluding CH_4 from LULUCF	kt CO_2 eq	11,339.18	11,339.18	12,602.33	13,290.73	13,997.14	12,770.64	12,212.58	13,202.54	11,132.49	13,202.46	10,920.79
N_2O emissions including N_2O from LULUCF	kt CO_2 eq	4,730.84	4,730.84	4,846.46	5,098.03	4,690.06	4,167.08	4,033.01	74,693.76	4,720.48	4,694.74	4,663.32
N_2O emissions excluding N_2O from LULUCF	kt CO_2 eq	4,190.03	4,190.03	4,369.04	4,649.02	4,207.85	3,803.55	3,667.32	4,613.30	4,640.02	4,614.28	4,582.86
HFCs	kt CO_2 eq	0.00	0.00	30.65	288.45	841.36	1,508.23	1,727.82	2,875.82	1,514.98	2,837.43	631.12
PFCs	kt CO_2 eq	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
SF_6	kt CO_2 eq	0.00	0.00	14.62	18.43	35.50	52.08	55.25	11.05	227.26	114.05	227.26
Other gases												

Table 7(a) Provision of public financial support: contribution through multilateral channels

Donor funding	Total Amount				Status	Funding source	Financial instrument	Type of support	Sector
	Core/general		Climate-specific						
	Domestic Currency	USD	Domestic Currency	USD					
2013	7 248 472.00	9 623 568.80	-	-	-	-	-	-	-
Total contributions through multilateral channels	-	-	-	-	-	-	-	-	-
Multilateral climate change funds [g]	-	-	-	-	-	-	-	-	-
1. Global Environment Facility	-	-	-	-	-	-	-	-	-
2. Least Developed Countries Fund	-	-	-	-	-	-	-	-	-
3. Special Climate Change Fund	-	-	-	-	-	-	-	-	-
4. Adaptation Fund	-	-	-	-	-	-	-	-	-
5. Green Climate Fund	-	-	-	-	-	-	-	-	-
6. UNFCCC Trust Fund for Supplementary Activities	-	-	-	-	-	-	-	-	-
7. Other multilateral climate change funds	-	-	-	-	-	-	-	-	-
Multilateral financial institutions, including regional development banks	-	-	-	-	-	-	-	-	-
1. World Bank	1 420 000,00	1 885 289,40	-	-	Provided	ODA	Grant	Other (Not Applicable)	Not applicable
2. International Finance Corporation	-	-	-	-	-	-	-	-	-
3. African Development Bank	2 004 210,00	2 660 926,70	-	-	Provided	ODA	Grant	Other (Not Applicable)	Not applicable
4. Asian Development Bank	-	-	-	-	-	-	-	-	-
5. European Bank for Reconstruction and Development	-	-	-	-	-	-	-	-	-
6. Inter-American Development Bank	-	-	-	-	-	-	-	-	-
7. Other	-	-	-	-	-	-	-	-	-
Andean Development Corporation (CAF)	3 750 000,00	4 978 757,30	-	-	Provided	ODA	Grant	Other (Not applicable)	Not applicable
Specialized United Nations bodies	-	-	-	-	-	-	-	-	-
1. United Nations Development Programme	-	-	-	-	-	-	-	-	-
UNDP	37 288,00	49 506,10	-	-	Provided	ODA	Grant	Other (Not Applicable)	Not applicable
2. United Nations Environment Programme	-	-	-	-					
UNEP	36 974,00	49 089,20	-	-	Provided	ODA	Grant	Other (Not Applicable)	Not applicable
3. Other	-	-	-	-	-	-	-	-	-
2014	3 469 923.00	4 606 907.87	-	-	-	-	-	-	-
Total contributions through multilateral channels	-	-	-	-	-	-	-	-	-
Multilateral climate change funds [g]	-	-	-	-	-	-	-	-	-
1. Global Environment Facility	-	-	-	-	-	-	-	-	-
2. Least Developed Countries Fund	-	-	-	-	-	-	-	-	-
3. Special Climate Change Fund	-	-	-	-	-	-	-	-	-
4. Adaptation Fund	-	-	-	-	-	-	-	-	-
5. Green Climate Fund	-	-	-	-	-	-	-	-	-
6. UNFCCC Trust Fund for Supplementary Activities	-	-	-	-	-	-	-	-	-
7. Other multilateral climate change funds	-	-	-	-	-	-	-	-	-
Multilateral financial institutions, including regional development banks	-	-	-	-	-	-	-	-	-
1. World Bank	1 490 000,00	1 978 226,24	-	-	Provided	ODA	Grant	Other (Not Applicable)	Not applicable

2. International Finance Corporation	-	-	-	-	-	-	-	-	-
3. African Development Bank	1 478 108,00	1 962 437,61	-	-	Provided	ODA	Grant	Other (Not Applicable)	Not applicable
4. Asian Development Bank	250 000,00	331 917,15	-	-	Provided	ODA	Grant	Other (Not applicable)	Not applicable
5. European Bank for Reconstruction and Development	-	-	-	-	-	-	-	-	-
6. Inter-American Development Bank	169 279,00	224 746,20	-	-	Provided	ODA	Grant	Other (Not Applicable)	Not applicable
7. Other	-	-	-	-	-	-	-	-	-
Specialized United Nations bodies	-	-	-	-	-	-	-	-	-
1. United Nations Development Programme	-	-	-	-	-	-	-	-	-
UNDP	39 872,00	52 936,80	-	-	Provided	ODA	Grant	Other (Not Applicable)	Not applicable
2. United Nations Environment Programme	-	-	-	-	-	-	-	-	-
3. Other	-	-	-	-	-	-	-	-	-
UNFCCC core contribution - 61% eligible as ODA	42 664,00	56 643,65	-	-	Provided	ODA	Grant	Other (Not Applicable)	Not applicable

Table 7(b) Provision of public financial support: contribution through bilateral, regional and other channels

Donor funding	Total Amount		Status	Funding source	Financial instrument	Type of Support	Sector	Additional Information
	Climate-specific							
	euro (€)	USD						
2013								
Total contributions through bilateral, regional and other channels								
Line of Credit of 100 Million Euro for imports (renewable energies, environment and water) - Cabo Verde	8 386 816,00	11 134 912,37	Provided	ODA	Concessional Loan (CL)	Mitigation	Energy	Technology Transfer (TT)
ODA Loan of 4.5M€ for imports (renewable energies, environment and water) - Cabo Verde	4 449 175,00	5 907 030,10	Provided	ODA	CL	Mitigation	Energy	TT
Capacity Building for Developing Strategies on Low Carbon Resilient (Cabo Verde)	90 190,00	119 742,30	Provided	ODA	Grant	Mitigation	Other (General Environment Protection - GEP)	Capacity Building (CB)
Community Access Program to Renewable Energy – Bambadinca (Guinea-Bissau)	145 938,00	193 757,30	Provided	ODA	Grant	Mitigation	Energy	TT
Capacity Building for Developing Strategies on Low Carbon Resilient (São Tomé and Príncipe)	90 190,00	119 742,43	Provided	ODA	Grant	Mitigation	Other (GEP)	CB
Atlas of renewable energy (Mozambique)	924 805,00	1 227 834,57	Provided	ODA	Grant	Mitigation	Energy	TT
Capacity Building for Developing Strategies on Low Carbon Resilient (Mozambique)	90 190,00	119 742,43	Provided	ODA	Grant	Mitigation	Other (GEP)	CB
Installation of photovoltaic systems (Mozambique)	1 409 395,00	1 871 209,51	Provided	ODA	Grant	Mitigation	Energy	TT and CB
IAMCD - Mainstreaming Adaptation to Climate Change in Development - Cabo Verde	47 571,00	63 158,52	Provided	ODA	Grant	Adaptation	Other (GEP)	CB
TESE - NGO support to Provide electricity (with resource to renewable energies) to schools - São Tomé e Principe	18 630,00	24 734,47	Provided	ODA	Grant	Mitigation	Energy	TT
IAMCD - Mainstreaming Adaptation to Climate Change in Development (São Tomé and Príncipe)	47 571,00	63 158,52	Provided	ODA	Grant	Adaptation	Other (GEP)	CB
IAMCD - Mainstreaming Adaptation to Climate Change in Development (Mozambique)	47 571,00	63 158,52	Provided	ODA	Grant	Adaptation	Other (GEP)	CB
Pilot-projects 'implementation of Local Action Programmes in Climate Change Adaptation in Mozambique - IPPALAM (Mozambique)	227 718,00	302 334,04	Provided	ODA	Grant	Adaptation	Other (Other Multisector)	CB
2014								
Total contributions through bilateral, regional and other channels								
Line of Credit of 100 Million Euro for imports (renewable energies, environment and water) - Cabo Verde	5 840 869,00	7 749 594,00	Provided	ODA	CL	Mitigation	Energy	TT
ODA Loan of 4.5M€ for imports (renewable energies, environment and water) - Cabo Verde	20 014,00	26 554,30	Provided	ODA	CL	Mitigation	Energy	TT
Capacity Building for Developing Strategies on Low Carbon Resilient (Cabo Verde)	180 381,00	239 327,30	Provided	ODA	Grant	Mitigation	Other (GEP)	CB
Roadmap of waste - Cape Verde	150 000,00	199 018,20	Provided	ODA	Grant	Mitigation	Water and sanitation (W&S)	CB and TT
Cooperation between Águas de Portugal and Cabo Verde in the water and sanitation sector - Cabo Verde	1 058,00	1 403,70	Provided	ODA	Grant	Mitigation	W&S	CB
Community Access Program to Renewable Energy - Bambadinca (Guinea-Bissau)	159 978,00	212 256,90	Provided	ODA	Grant	Mitigation	Energy	TT
Capacity Building for Developing Strategies on Low Carbon Resilient (São Tomé and Príncipe)	180 381,00	239 327,30	Provided	ODA	Grant	Mitigation	Other (GEP)	CB
Energy generation from biogas (São Tomé and Príncipe)	98 814,00	131 105,20	Provided	ODA	Grant	Mitigation	Energy	TT
Atlas of renewable energy (Mozambique)	554 882,00	736 210,70	Provided	ODA	Grant	Mitigation	Energy	TT
Capacity Building for Developing Strategies on Low Carbon Resilient (Mozambique)	180 381,00	239 327,30	Provided	ODA	Grant	Mitigation	Other (GEP)	CB
Installation of photovoltaic systems (Mozambique)	227 149,00	301 378,50	Provided	ODA	Grant	Mitigation	Energy	TT and CB

National Plan for Support of Urban Sanitation in the perspective of Reducing Emissions and Climate Change Adaption (PLASU-AC) - Mozambique	765 404,00	1 015 528,70	Provided	ODA	Grant	Mitigation	W&S	CB
IAMCD - Mainstreaming Adaptation to Climate Change in Development (Cabo Verde)	76 113,00	100 985,80	Provided	ODA	Grant	Adaptation	Other (GEP)	CB
NGO ADPM - A Sustainable Development for Chã de Norte (Cabo Verde)	8 280,00	10 985,80	Provided	ODA	Grant	Adaptation	Cross-cutting	TT
NGO TESE - Program of Institutional Strengthening and Quality of Water Supply Service in the cities of Bafatá, Bambadinca and Mansoa (Guinea Bissau)	75 000,00	99 509,10	Provided	ODA	Grant	Adaptation	W&S	CB and TT
Cooperation between Águas de Portugal and Guinea-Bissau in the water and sanitation sector (Guinea Bissau)	731,00	969,90	Provided	ODA	Grant	Adaptation	W&S	CB
IAMCD - Mainstreaming Adaptation to Climate Change in Development (São Tomé and Príncipe)	76 113,00	100 985,80	Provided	ODA	Grant	Adaptation	Other (GEP)	CB
Cooperation between Águas de Portugal and Sao Tomé & Principe in the water and sanitation sector (São Tomé and Principe)	2 238,00	2 969,40	Provided	ODA	Grant	Adaptation	W&S	CB
IAMCD - Mainstreaming Adaptation to Climate Change in Development (Mozambique)	76 113,00	100 985,80	Provided	ODA	Grant	Adaptation	Other (GEP)	CB
Pilot-projects 'implementation of Local Action Programmes in Climate Change Adaptation in Mozambique - IPPALAM (Mozambique)	455 436,00	604 266,90	Provided	ODA	Grant	Adaptation	Other (Multisector)	CB
NGO OIKOS - A ''comunidade-modelo'' (Mozambique)	11 832,00	15 698,60	Provided	ODA	Grant	Adaptation	Other (Humanitarian Aid)	TT and CB
NGO OIKOS - Improved Resistance to Natural Disasters (Mozambique)	11 880,00	15 762,20	Provided	ODA	Grant	Adaptation	Other (Humanitarian Aid)	TT and CB
Cooperation between Águas de Portugal and Timor Leste in the water and sanitation sector (Timor Leste)	61 269,00	81 291,00	Provided	ODA	Grant	Adaptation	W&S	CB

Table 8: Provision of technology development and transfer support

Measures and activities related to technology transfer	Recipient country and/or region	Targeted area	Sector	Source of the funding for technology transfer	Activities undertaken by	Status	Additional information
Line of Credit of 100Million € for imports (renewable energies, environment and water)	Cape Verde	Mitigation	Energy	Public	Public	Implemented	-
ODA Loan of 4.5Million € for imports (renewable energies, environment and water)	Cape Verde	Mitigation	Energy	Public	Public	Implemented	-
Community Access Program to Renewable Energy (Bambadinca)	Guinea-Bissau	Mitigation	Energy	Public	Public	Implemented	-
Atlas of Renewable Energy	Mozambique	Mitigation	Energy	Public	Public	Implemented	-
Installation of Photovoltaic Systems	Mozambique	Mitigation	Energy	Public	Public	Implemented	-
IAMCD - Mainstreaming Adaptation to Climate Change in Development	Sao Tome and Principe	Adaptation	Other (General Environment Protection)	Public	Public	Implemented	-
TESE - NGO support to Provide electricity (with resource to renewable energies)	Sao Tome and Principe	Mitigation	Energy	Public	Public	Implemented	-
NGO ADPM - A Sustainable Development for Chã de Norte	Cape Verde	Adaptation	Other (Cross-cutting)	Public	Public	Implemented	-
NGO TESE - Program of Institutional Strengthening and Quality of Water Supply Service in the Cities of Bafatá, Bambadinca and Mansoa	Guinea-Bissau	Adaptation	Water and sanitation	Public	Public	Implemented	-
NGO OIKOS - A "Comunidade-Modelo"	Mozambique	Adaptation	Other (Humanitarian Aid)	Public	Public	Implemented	-
NGO OIKOS - Improved Resistance to Natural Disasters	Mozambique	Adaptation	Other (Humanitarian Aid)	Public	Public	Implemented	-

Table 9. Provision of capacity-building support

Programme or project title	Recipient country/ region	Targeted area	Description of programme or project
IAMCD - Mainstreaming Adaptation to Climate Change in Development	Mozambique/ Sao Tome and Principe/ Cape Verde	Adaptation	
Cooperation between Águas de Portugal and Cabo Verde in the Water Sanitation Sector	Cape Verde	Mitigation	
Pilot-projects Implementation of Local Action Programmes in Climate Change Adaptation in Mozambique - IPPALAM	Mozambique	Adaptation	
Capacity Building for Developing Strategies on Low Carbon Resilient	Sao Tome and Principe/ Cape Verde/ Mozambique	Mitigation	
Energy Generation from Biogas	Sao Tome and Principe	Mitigation	
Cooperation between Águas de Portugal and São Tomé e Principe in the Water Sanitation Sector	Sao Tome and Principe	Adaptation	
Cooperation between Águas de Portugal and Timor-Leste in the Water Sanitation Sector	Timor-Leste	Adaptation	
Roadmap of Waste	Cape Verde	Technology Development and Transfer	
National Plan for Support of Urban Sanitation in the Perspective of Reducing Emissions and Climate Change Adaptation (PLASU-AC)	Mozambique	Mitigation	