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Report on the in-depth review of the third national communication of Greece

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I. NATIONAL CIRCUMSTANCES RELEVANT TO GREENHOUSE GAS EMISSIONS AND REMOVALS

A. Introduction

1. The secretariat received Greece's third national communication under the United Nations Framework Convention on Climate Change (UNFCCC), hereinafter referred to as the NC3, on 14 February 2003.[1] An in-depth review was carried out between October 2004 and July 2005, including a visit to Athens from 8 to 12 November 2004. The review team consisted of Mr. Graham Sem (Papua New Guinea), Mr. Olev Liik (Estonia), Mr. Bernd Gugele (European Community) and Mr. Harald Diaz-Bone (UNFCCC secretariat, coordinator).

2. The review team had a number of meetings and discussions on all aspects of Greece's climate policy as outlined in the NC3. During these meetings with government officials, academics, and business and environmental non-governmental organizations (NGOs), the team was provided with a wealth of additional materials and information which supported and updated the information provided in the NC3.

B. National circumstances

3. ***Geography:*** Greece is situated in the south-eastern part of Europe and occupies the southernmost extension of the Balkan Peninsula. Its national territory has an area of 131,957 km^2 and borders on Albania, The Former Yugoslavian Republic of Macedonia (FYROM) and Bulgaria in the north and Turkey in the east. The mainland accounts for 80 per cent of the land area, with the remaining 20 per cent divided among some 3,000 islands, the biggest of which are Crete, Lesvos and Rhodos. Greece's extensive coastline along the Aegean and Adriatic seas exceeds 15,000 km in length. Partly forested areas and grasslands cover 38 per cent of the total area and are mostly used for grazing by sheep, goats and cattle. Another 30 per cent of the total area is occupied by agricultural land, and forests of coniferous and broadleaf trees cover 19 per cent. Other land uses, including areas occupied by brushwood, alpine areas and internal waterways, account for 8 per cent, with uncultivated and abandoned land making up the remaining 6 per cent of the total area.

4. ***Demography:*** In 2002, the total population of Greece amounted to 11.0 million, 35 per cent of which lived in the agglomeration of greater Athens. Compared to 1990, the total population increased by 6.7 per cent. With an average population density of 84 inhabitants per km^2, Greece is amongst the least densely populated member States of the European Union (EU). About 60 per cent of the population lives in towns and cities. The three biggest cities are Athens, Thessaloniki and Piraeus.

5. ***Economy:*** In 2002, the gross domestic production (GDP) was USD 176.6 billion.[2] During the 1990s, the national economy grew considerably faster than the population (26 per cent and 5.6 per cent, respectively, see table 1). Still, Greece remained among the poorest countries in the EU-15[3]: in 2002, per capita GDP amounted to USD 16,123, which was 68.2 per cent of the average value for the EU-15. During 1994–2001, Greece's economy grew faster than the average of EU-15 (3.3 per cent per annum for Greece, and 2.6 per cent for the EU-15). Furthermore, joining the Euro currency zone in 2001 helped to accelerate economic growth, with annual growth rates of around 4 per cent during 2000–2002. This economic catch-up process resulted in significant increases in energy production, electricity consumption and GHG emissions (see table 1).

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[1] The submission date was 30 November 2001 (decision 11/CP.4).

[2] Calculated using the method of purchasing power parities (PPP) and expressed in USD of 1995.

[3] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom of Great Britain and Northern Ireland.

6. In 2001, agriculture and mining contributed 8 per cent to the total GDP, a decrease from 9.9 per cent in 1995. The contribution of the industrial sector for the time period 1995–2001 broadly remained stable at about 22 per cent of the total GDP, while the services sector increased from 67.7 per cent to 70.0 per cent. Still, agriculture and mining held a relatively high share of total employment (17.0 per cent in 2000), and was dependent on state and EU subsidies. Industrial production rose by 14.6 per cent during 1990–2002. The unemployment rate was 10.0 per cent in 2002. The ratio of public debt to GDP decreased continuously and reached 99.6 per cent in 2001.

Table 1. Main macroeconomic indicators and greenhouse gas emissions[a]

	1990	2000	2002	Change (%) 1990–2000	Change (%) 2000–2002
Population (millions)	10.3	10.9	11.0	+5.6	+0.3
Gross domestic product – GDP (billions USD of 1995)[b]	129.8	163.5	176.6	+26.0	+8.0
Industrial Production Index (1995 = 100)	101.9	114.7	116.8	+12.6	+1.8
Total primary energy supply – TPES (Mtoe)	22.2	27.8	29.0	+25.4	+4.3
Electricity consumption (TWh)	32.8	49.6	53.5	+50.9	+7.9
Greenhouse gas (GHG) emissions[c] (Tg[d] CO_2 equivalent)	109.4	133.8	135.0	+22.3	+0.9
GHG emissions per capita (Mg CO_2 equivalent)	10.6	12.3	12.3	+15.7	+0.6
GHG emissions per GDP unit (kg CO_2 equivalent per USD of 1995)	0.843	0.818	0.765	–3.0	–6.5

[a] Data for population, GDP, TPES, and electricity are from "Energy balances of OECD countries, 1999–2002", OECD/IEA, Paris, 2004. GHG data are from Greece's GHG inventory submission in 2004.
[b] Calculated using the method of purchasing power parities (PPP).
[c] Without CO_2 emissions from land-use change and forestry (LUCF).
[d] One teragram (Tg) is equal to 1,000 gigagrams (Gg) or one million tonnes (Mt).

7. ***Energy:*** In 2002, Greece's energy profile showed a relatively high share of liquid fuels (58 per cent), mainly petroleum products, and solid fuels (31 per cent), mainly domestic lignite, when compared to other industrialized countries. As a result of a strategy to diversify energy supply, natural gas was introduced in 1997 and accounted for 6 per cent of the TPES in 2002. The contribution of renewable energy sources (RES), including large hydro, varied from 4.5 per cent to 6.3 per cent following the fluctuations in energy production from large hydropower plants.

8. Between 1990 and 2002, the total primary energy supply (TPES) grew by 30.9 per cent, with a slight shift from lignite to gas. During this period, the share of liquid fuels was almost constant, whereas the share of solid fuels declined from 36 per cent to 31 per cent. Excluding large hydro, the share of RES increased from 3.7 per cent in 1990 to 4.1 per cent in 2002. The sharp increase in energy-related CO_2 emissions, by 27.9 per cent during 1990–2002, broadly followed the growth in TPES.

9. ***Electricity:*** In 2002, 64 per cent of total electricity generation was based on solid fuels, mainly domestic lignite. The shares of liquid fuels and natural gas in total electricity production were 16 per cent and 12 per cent, respectively. Electricity production increased by 55 per cent between 1990 and 2002. During this period, the share of solid and liquid fuels decreased by 8 and 6 per cent, respectively, whereas natural gas increased by 12 per cent. The share of RES in electricity production increased slightly from 6 per cent in 1990 to 8 per cent in 2002.

10. ***Political structure:*** The Hellenic Republic is a parliamentary democracy. The constitution of 1975, as revised in 1986 and in 2000, vests legislative power in the national parliament, a one-chamber parliament with 300 members. The President is the head of State. The Government, chaired by the Prime Minister, is responsible for domestic and foreign policy. The country is divided into 13 administrative regions, each headed by a secretary general who is appointed by the Council of Ministers and who reports to the Minister of the Interior. The primary responsibility of the regional authorities is the development and implementation of regional economic-development plans. Such plans are financed by the Ministry of Economy and Finance.

11. Below the 13 administrative regions are 50 prefectures, each headed by a directly elected prefect. Regional authorities coordinate the activities of the prefectures in their jurisdiction. Finally, below the prefectures are more than 1,000 local authorities: 900 municipalities (with populations greater than 10,000 people) and 133 communities, each governed by a directly elected mayor and council.

12. ***Institutional arrangements:*** The Ministry for the Environment, Physical Planning and Public Works (MEPPPW) is responsible for the coordination of climate change activities, whereas other ministries are responsible for integrating environmental policy targets and the National Action Plan on Climate Change (NAPCC) within their respective fields. The Council of Ministers is responsible for the final approval of all policies and measures relating to the mitigation of climate change.

C. Key developments in climate change policies

13. Greece ratified the UNFCCC in August 1994 and has submitted three national communications, in 1995, 1997 and 2003. During the review, the team analysed the information provided in the NC3 together with data from the most recent inventory submission of Greece to the UNFCCC secretariat, which contains data on emissions trends for the period 1990–2002. The results of this analysis suggest that Greece hardly contributed to achieving the aim of the Convention, as its total GHG emissions increased by 22.3 per cent in the period from 1990 to 2000, without considering CO_2 from LUCF, and by 24.4 per cent if CO_2 from LUCF is considered. The review team also noted that the national target of limiting the increase of CO_2, CH_4 and N_2O emissions to 15±3 per cent during 1990–2000, as set in the 1995 National Action Plan on Climate Change (NAPCC), was not achieved.

14. Greece signed the Kyoto Protocol in April 1998 and ratified it jointly with the other EU member States in May 2002. Its Kyoto target under the EU burden-sharing agreement is to keep total GHG emissions during the first commitment period (2008–2012) below 125 per cent of the 1990 level.[4] The review team noted that, in conjunction with the ratification of the Kyoto Protocol, the Second National Programme on Climate Change (NPCC2) was adopted in May 2002 and approved by the Council of Ministers in February 2003. The NPCC2 aimed at achieving the Kyoto target and mainly built on cost-effective polices and measures that were already integral parts of sectoral policies, including the promotion of natural gas, RES and energy efficiency.

15. Besides the aim of economic development, the 2002 National Strategy for Sustainable Development (NSSD) has three main objectives: environmental protection, social cohesion and the integration of sectoral policies. Mitigation of climate change is one of six central targets identified in the NSSD and one out of seven "sectors of action and measures" for the reduction of environmental pressures in Greece.[5] According to the NSSD, the introduction of adequate economic instruments aimed at "getting the prices right" and at a long-term change in consumption and production patterns.

16. In December 2004, Greece submitted a National Allocation Plan (NAP) under the EU Emissions Trading System (EU-ETS), which was approved by the European Commission in June 2005. The NAP allocates 74.16 million allowances per year (as an average of the period 2005–2007) to 168 installations, mainly in the energy industries sector. Preparations for the installation of a national registry system had not started by mid 2005.

17. The review of the NC3 and the additional information provided during the visit to Athens allowed the review team to conclude that the NC3 is a comprehensive document that well reflected the

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[4] The base year for the fluorinated gases, i.e. HFC, PFC and SF_6, is 1995.

[5] The other six "sectors of action and measures" of the NSSD included management of air quality, water resources, waste and forests, as well as the abatement of desertification and the protection of biodiversity and natural ecosystems.

status of Greece's climate change policy at the time it was prepared and published. It covered with sufficient detail the GHG emission trends and projections, policies and measures, vulnerability and impact assessment of climate change and all other topics required by the UNFCCC reporting guidelines.[6]

II. GREENHOUSE GAS INVENTORY INFORMATION

A. Inventory preparation and reporting

18. ***Reporting and institutional arrangements:*** MEPPPW is responsible for preparing and reporting Greece's GHG inventory. On behalf of MEPPPW, the National Observatory of Athens (NOA) collects the data, compiles the inventory, archives the data and develops a quality assurance/quality control (QA/QC) system for the inventory. The national statistical service and other organizations provide NOA with activity data and emission factors.

19. ***Comprehensiveness:*** In general, the NC3 section on inventory complies with the UNFCCC reporting guidelines. It provides data on the GHG emission inventory for the period 1990–2000, and includes emission data for carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), as well as for nitrous oxides (NO_x), carbon monoxide (CO), sulphur dioxide (SO_2), and non-methane volatile organic compounds (NMVOC). Data on emissions of sulphur hexafluoride (SF_6) are not provided.[7] The review team noted that some sources are not included in the GHG inventory, e.g. some industrial processes; HFCs from refrigeration in commercial and industrial use; and CH_4 recovery from landfills. The review team encourages Greece to improve the completeness of the GHG inventory and to provide more detailed descriptions of the factors underlying the emission trends. Furthermore, brief explanations of the main recalculations undertaken since the previous national communication would increase the transparency of the section on inventory.

20. Although considerable improvements have been made in recent years, the review team noted that some major issues remain with the collection of activity data, mainly relating to timing and/or confidentiality:

(a) Final energy balance data for the latest year of the inventory is not usually available before the year of submission of the GHG inventory to the UNFCCC secretariat; data on energy use in industrial sub-sectors (e.g. data for cement production in the sector of non-metallic minerals) are not available

(b) In industrial processes, some activity data are not available, partly for reasons of confidentiality

(c) In agriculture, there is a time lag of several years for publishing activity data

(d) For LUCF, the forestry inventory has been stopped temporarily.

21. During the country visit, the review team learned that projects to improve the quality of energy-related data have started and that these problems are expected to be solved for the 2006 submission. Also the participation of private companies in the EU-ETS is expected to contribute to improving the availability of data for the relevant industries. A QA/QC plan was announced to be in use from the 2005 inventory submission onwards. The review team appreciated that Greece has started projects to improve the data collection process and encouraged it to establish a National Inventory System as required under Article 5.1 of the Kyoto Protocol.

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[6] Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications. Document FCCC/CP/1999/7.

[7] First estimates for SF_6 emissions in 2004 were provided during the country visit.

22. ***Methodology:*** The inventory data for the years 1990–2000 as reported in the NC3 were calculated according to the Revised 1996 IPCC Guidelines.[8] The information provided in the NC3 chapter on GHG inventory was consistent with that provided in the 2002 annual inventory information submission (CRF 2002, see table 2). The GHG inventory has been subject to major recalculations since the preparation of the NC2, in order to improve completeness and consistency of GHG emission trends. Therefore, inventory data as presented in the NC2, in the NC3 and in the latest inventory submission from 2004 (national inventory report (NIR) 2004) differ to some extent. In particular, recalculations of N_2O emissions from agricultural soils due to improved data on animal production contributed to the increase in total N_2O emissions by 89–98 per cent. The inclusion of indirect N_2O emissions from agricultural soils was the main reason for the 30–33 per cent change between the NC3 and the NIR 2004.

Table 2. Estimates for emissions in 1990 and 1995: results of recalculations

	Gg CO_2 equivalent				Change (%)		
	NC2	NC3	CRF 2002	NIR 2004	NC2 – NC3	NC3 – CRF 02	CRF 02 – NIR 04
1990 total CO_2 (without LUCF)	84 575	84 336	84 336	82 818	0	0	–2
1995 total CO_2 (without LUCF)	90 492	87 644	87 644	86 705	–3	0	–1
1990 total CH_4	9 304	8 743	8 743	8 994	–6	0	3
1995 total CH_4	9 568	9 493	9 493	9 734	–1	0	3
1990 total N_2O	5 359	10 623	10 623	14 144	98	0	33
1995 total N_2O	5 234	9 899	9 899	12 865	89	0	30
1990 total fluorinated gases	–	1 193	1 193	1 193		0	0
1995 total fluorinated gases	–	3 452	3 452	3 452		0	0
1990 total GHG (without CO_2 from LUCF)	99 238	104 895	104 895	107 149	6	0	2
1995 total GHG (without CO_2 from LUCF)	105 294	110 488	110 488	112 756	5	0	2

23. The review team encouraged Greece to establish a national system, to use higher-tier methods where necessary (e.g. CH_4 from enteric fermentation and from landfills) and to address the existing gaps. The inventory for the year 2002 was generally assessed to be transparent. Quantitative uncertainty estimates were available. The following analysis of the GHG emission profile and trends is based on the data reported in the 2004 inventory submission.

B. Emission profile and trends

24. ***Emissions profile:*** Greece's GHG emissions profile shows a clear domination by the energy sector, with CO_2 as the main GHG. In 1990, CO_2 accounted for 76 per cent of the total GHG emissions (without LUCF), followed by N_2O (13 per cent) and CH_4 (8 per cent). A similar pattern can be seen for the year 2002, when the proportion of CO_2 was 78 per cent, followed by N_2O (10 per cent) and CH_4 (8 per cent). Table 3 shows the emission trends by gas in the period from 1990 to 2002.

Table 3. GHG emission trends by gas, 1990 and 1995–2002

	Gg CO_2 equivalent									Change (%)
	1990	1995	1996	1997	1998	1999	2000	2001	2002	1990–2002
CO_2[a]	82 818	86 705	89 041	93 637	98 289	97 594	103 429	105 506	105 504	27.4
CH_4	8 994	9 734	10 065	10 187	10 812	10 838	11 415	11 207	11 440	27.2
N_2O	14 144	12 865	13 437	13 882	13 901	13 655	14 494	13 993	13 962	–1.3
Fluorinated gases	1 193	3 452	3 988	4 359	4 257	4 288	4 429	3 936	4 087	242.7
Net GHG[b]	108 623	112 354	116 459	121 663	130 089	126 394	137 937	133 347	133 101	22.5
Total GHG[c]	**107 149**	**112 756**	**116 531**	**122 066**	**127 259**	**126 375**	**133 768**	**134 642**	**134 992**	**26.0**

[a] CO_2 emissions without LUCF.
[b] Total GHG (with net CO_2 emissions/removals from LUCF).
[c] Total GHG (without CO_2 from LUCF).

[8] *Revised 1996 Intergovernmental Panel on Climate Change (IPCC) Guidelines for National Greenhouse Gas Inventories.*

25. Total GHG emissions (excluding CO_2 from LUCF) increased by 26 per cent between 1990 and 2002, while total GHG emissions including net removals from LUCF increased by 23 per cent. This was mainly attributed to CO_2 emissions, which increased by 27 per cent over this period. Emissions of CH_4 also increased by 27 per cent, while emissions of N_2O decreased by 1 per cent. A major part of these increases was experienced after 1995 (trends for 1995–2002: CO_2 +22 per cent, CH_4 +18 per cent, N_2O +9 per cent, total GHG +20 per cent). Emissions of fluorinated gases accounted for about 1 per cent of total GHG emissions in 1990 and 3 per cent in 2002.

Table 4. Carbon dioxide emissions by source, 1990 and 1995–2002

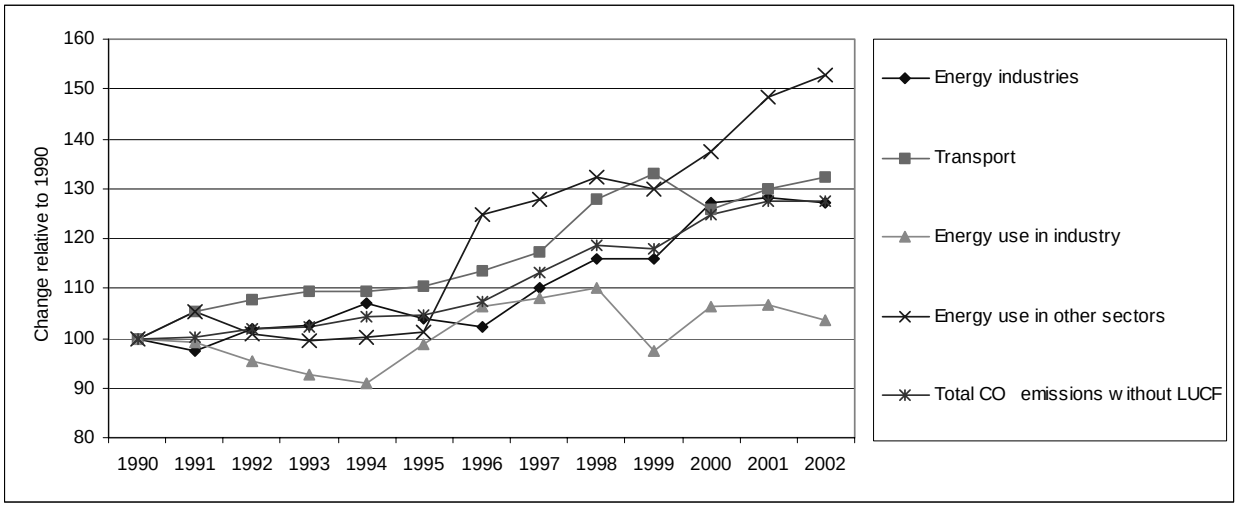
	Gg CO_2 equivalent									Change (%)
GHG source and sink categories	**1990**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**1990–2002**
Energy	76 471	79 796	82 056	86 516	91 285	90 590	95 803	97 862	97 812	27.9
Energy industries	43 302	45 056	44 205	47 668	50 254	50 220	55 058	55 570	55 109	27.3
Energy use in industry	9 792	9 661	10 412	10 570	10 772	9 552	10 415	10 436	10 143	3.6
Transport	15 355	16 967	17 424	18 025	19 651	20 408	19 303	19 967	20 299	32.2
Energy use in other sectors	8 021	8 111	10 016	10 252	10 608	10 410	11 026	11 889	12 261	52.9
Industrial processes	6 177	6 757	6 834	6 970	6 852	6 845	7 481	7 489	7 537	22.0
Land-use change and forestry (LUCF)	1 474	–402	–72	–404	2 830	19	4 170	–1 295	–1 892	–228.4
Total CO_2 emissions/removals with LUCF	84 292	86 303	88 969	93 234	101 119	97 613	107 599	104 211	103 612	22.9
Total CO_2 emissions without LUCF	**82 818**	**86 705**	**89 041**	**93 637**	**98 289**	**97 594**	**103 429**	**105 506**	**105 504**	**27.4**
International bunkers	10 475	13 863	12 399	12 343	13 594	12 099	13 857	13 351	12 215	16.6

26. ***Carbon dioxide:*** Total CO_2 emissions in Greece were 105,504 Gg in 2002. The major emitters were energy industries (52 per cent of total CO_2 emissions), followed by transport (19 per cent), energy use in other sectors (12 per cent), energy use in industry (10 per cent), and industrial processes (7 per cent). The review team noted that CO_2 emissions from agriculture, including agricultural soils, were not reported. Net CO_2 emissions from LUCF have decreased by 228 per cent since 1990 and equalled 2 per cent of total CO_2 emissions in 2002. They show large annual fluctuations, mainly due to forest fires. In accordance with the IPCC Guidelines, emissions of CO_2 from international bunkers were not included in the national totals; in 2002, they equalled 12 per cent of total CO_2 emissions or 9 per cent of total GHG emissions.

27. As shown in table 4 and figure 1, the trend in CO_2 emissions between 1990 and 2002 increased steadily, with stagnation in the years 1999 and 2002, broadly following the trend of CO_2 emissions from energy industries. Since 1995, the annual growth in CO_2 emissions has increased broadly in line with accelerated growth in GDP and energy consumption (see paragraph 5). The main reasons for the stable CO_2 emissions in 1999 were constant power production from coal (while gas-fired and hydro power production increased), and a decline in liquid and solid fuels in manufacturing industries. In 2002, the main factor was a decline in coal-fired power production.

28. Between 1990 and 2002, CO_2 from energy industries grew by 27 per cent (+11,807 Gg), mainly driven by a 55 per cent increase in power production; about two thirds of electricity was produced from domestic lignite (see paragraph 9). The trend in CO_2 emissions from fuel combustion also showed notable increases in transport (+32 per cent or 4,943 Gg) and energy use in other sectors (+53 per cent or 4,239 Gg). Between 1990 and 2002, the numbers of registered passenger cars and heavy-duty vehicles increased by 116 per cent and 141 per cent respectively. In the residential and services sector, thermal insulation and the use of solar energy could not outweigh the growing number of dwellings, the improved living standard and the increasing floor area of commercial premises.

Figure 1. Carbon dioxide emissions: percentage change from 1990, by source



29. Between 1990 and 2002, CO_2 emissions from energy use in industry and from industrial processes increased by 4 per cent and 22 per cent respectively, mainly because of a 33 per cent increase of cement clinker production. The review team noted that reductions in the estimates for CO_2 emissions from the chemical industry were at least partly a reflection of an inconsistent time series.

30. ***Methane:*** Emissions of CH_4 amounted to 11,440 Gg CO_2 equivalent in 2002. Solid waste disposal on land (46 per cent) and enteric fermentation (26 per cent) accounted for the largest share.

Table 5. Methane emissions by source, 1990 and 1995–2002

	Gg CO_2 equivalent									Change (%)
GHG source and sink categories	**1990**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**1990–2002**
Energy	1 450	1 588	1 737	1 732	1 823	1 887	1 989	2049	2 149	48.1
Fugitive emissions	1 135	1 246	1 295	1 286	1 379	1 443	1 532	1 581	1 679	47.9
Agriculture	3 569	3 566	3 583	3 592	3 595	3 600	3 599	3 606	3 619	1.4
Enteric fermentation	2 976	2 942	2 950	2 956	2 969	2 985	2 996	3 000	3 004	1.0
Manure management	497	483	483	484	487	490	490	490	490	-1.3
Waste	3 855	4 529	4 689	4 809	5 066	5 309	5 451	5 497	5 664	47.0
Solid waste disposal on land	2 811	3 598	3 773	3 932	4 199	4 505	4 776	5 049	5 275	87.7
Waste-water handling	1 044	931	916	877	867	804	675	448	390	-62.7
Total emissions	**8 994**	**9 734**	**10 065**	**10 187**	**10 812**	**10 838**	**11 415**	**11 207**	**11 440**	**27.2**

31. As shown in table 5, between 1990 and 2002 overall CH_4 emissions increased steadily by 27 per cent. This was largely attributed to the increase in emissions from solid waste disposal on land (+88 per cent). Waste disposal on land increased by 56 per cent between 1990 and 2002; only a small fraction of total waste is being recycled. Information on CH_4 recovery from landfills was not available. Also, fugitive emissions (mostly from coal mining) increased substantially in absolute terms (1,679 Gg), whereas emissions from waste-water handling declined by 654 Gg CO_2 equivalent.

32. ***Nitrous oxide:*** Emissions from N_2O reached about 14,000 Gg CO_2 equivalent in 2002. Major sources were emissions from agricultural soils (63 per cent) and fuel combustion (28 per cent).

Table 6. Nitrous oxide emissions by source, 1990 and 1995–2002

GHG source and sink categories	Gg CO_2 equivalent									Change (%)
	1990	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**1990–2002**
Energy	3 066	3 228	3 414	3 544	3 659	3 550	3 794	3 917	3 921	27.9
Energy industries	1 779	1 901	1 896	1 999	2 060	2 035	2 204	2 227	2 206	24.0
Energy use in industry	483	465	525	516	531	444	488	492	464	-3.9
Transport	194	289	308	336	362	372	380	437	476	145.0
Energy use in other sectors	609	573	684	693	707	699	723	760	774	27.1
Industrial processes	713	565	645	566	566	566	566	566	566	-20.6
Chemical industry	713	565	645	566	566	566	566	566	566	-20.6
Agriculture	10 025	8 714	9 019	9 402	9 274	9 165	9 714	9 129	9 100	-9.2
Agricultural soils	9 714	8 420	8 725	9 108	8 977	8 865	9 411	8 827	8 799	-9.4
Manure management	301	283	282	283	286	290	292	291	290	-3.9
Waste	327	352	352	362	365	369	378	374	374	14.1
Waste-water handling	327	352	352	362	365	369	378	374	374	14.1
Total emissions	**14 144**	**12 865**	**13 437**	**13 882**	**13 901**	**13 655**	**14 494**	**13 993**	**13 962**	**-1.3**

33. During the period 1990 to 2002, total N_2O emissions decreased by 1 per cent (see table 6). The main reductions were reported for the chemical industry (–147 Gg from 1990 to 2002) and for agricultural soils (–915 Gg), whereas increases were reported for energy industries (+427 Gg), transport (+282 Gg) and energy use in other sectors (+165 Gg). The main reason for declining N_2O emissions from agricultural soils was a 25 per cent decrease in nitrogen input from synthetic fertilizers and manure.

34. ***Fluorinated gases:*** Emissions of fluorinated gases increased by 243 per cent between 1990 and 2002, when they still accounted for less than 3 per cent of total GHG emissions. Within the different groups of gases, a considerable variation can be observed (see table 7). Emissions of HFCs, mainly from production of HCFC, but in recent years also from consumption of halocarbons, increased notably, by 328 per cent from 1990 to 2002 (+19 per cent since the base year 1995). Emissions of PFCs, which originate from metal production, declined by 66 per cent between 1990 and 2002 (+ 7 per cent since the base year). Emissions of SF_6 were not estimated for the whole period.

Table 7. Fluorinated gases emission trends, 1990 and 1995–2002

	Gg CO_2 equivalent									Change (%)
	1990	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**1990–2002**
HFCs	935	3 369	3 916	4 194	4 053	4 156	4 281	3 845	3 999	327.6
PFCs	258	83	72	165	204	132	148	91	88	-65.7
Total	**1 193**	**3 452**	**3 988**	**4 359**	**4 257**	**4 288**	**4 429**	**3 936**	**4 087**	**242.7**

III. POLICIES AND MEASURES

A. Overview

35. ***Institutional arrangements:*** Policies and measures, as well as all other issues and actions related to climate change, are discussed within the framework of an inter-ministerial committee comprising representatives from several ministries, the Public Power Corporation (PPC), the NOA and the University of Athens. Non-governmental organizations and lower-level administrations are not included on an institutional basis. Coordinated by MEPPPW, this national climate change committee meets 2–3 times a year to expand on the initial formulation of climate change policies, as well as on monitoring and evaluation, modification and completion of the NAPCC (see paragraph 13) and the NPCC2 (see paragraph 14), and develops policy proposals for the government. In addition to policy coordination, the committee oversaw the preparation of the NC3.

36. ***Coverage and compliance with UNFCCC reporting guidelines:*** The NC3 provided an overview on policies and measures described in the NPCC2, which were additional to those presented in

the NC2. Implemented and adopted policies and measures in the energy, transport, waste and agricultural sectors were reported separately from planned policies and measures in these sectors. The review team acknowledged that the summary tables on policies and measures by sector, as presented in Annex II of the NC3, provided a transparent overview on these policies and measures, their status and estimated mitigation effect until 2010. Policies and measures in the forestry sector were reported in a separate section; however, they were not included in the summary tables, and the related mitigation effects were not estimated. The review team noted that this section of the NC3 broadly followed the UNFCCC guidelines, and encouraged Greece to provide information on how it believes the national policies and measures are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention.[9]

37. ***Monitoring and evaluation:*** By the time of the visit to Athens, a mechanism for systematic monitoring and evaluation of the effectiveness of policies and measures was not in place. However, the review team was informed that a project (within the third European Community Support Framework (CSF)) for the development of such a monitoring system, was in progress, and encouraged Greece to install procedures for the monitoring and evaluation of policies and measures on a regular basis.

38. ***Main drivers behind climate policy:*** According to the NSSD, Greece considers climate change to be one of the major environmental hazards, as the pressures of desertification, water scarcity and temperature rise are already visible in the country. The NSSD establishes a framework for the development of an action programme capable to meet the global challenges, compatible with guiding principles of the EU, and adaptable to national circumstances. The abatement of climate change is one of the six central targets of the NSSD; its target for the abatement of climate change coincides with the Kyoto target (see paragraph 14). The NPCC2 defines the policies and measures in order to ensure compliance with the Kyoto target, and elaborates on their sectoral implementation. The review team noted that EU legislation is a key driver for a number of these policies.

B. Cross-sectoral policies and measures

39. ***Emissions trading:*** As an EU member State, Greece intends to participate in the EU-ETS. Common Ministerial Decision 54409/2632/2004 establishes an emissions trading scheme in accordance with Directive 2003/87/EC. In December 2004, MEPPPW published a draft National Allocation Plan (NAP) for CO_2 emission allowances under the EU-ETS for the period 2005–2007, which was approved by the European Commission in June 2005. The NAP covers installations in the sectors of electricity generation (73 per cent of total allowances), cement production (15 per cent), refineries (5 per cent), and some other sectors (7 per cent), including the production of iron and steel, lime, glass, ceramic, and paper, as well as sintering and other combustion processes. Of the 74.43 million allowances allocated per year as an average of the period 2005–2007, 96 per cent were granted free of charge to 141 existing installations, while the remaining 4 per cent were reserved for 27 known and for unknown new entrants.

40. According to the NAP, the number of total allowances was 2.1 per cent below the CO_2 emissions in a business-as-usual scenario for the period 2005–2007. The participating entities are expected to achieve these reductions in CO_2 emissions through the implementation of domestic measures in the framework of the NPCC2. The review team noted that preparations for the installation of a national registry system had not started by mid 2005.

41. ***Economic instruments:*** Traditionally, the main instrument of Greece's climate change policy has been investment subsidies for new energy projects. The review team was informed that fiscal instruments and green certificates were under consideration, but a general shift towards taxes or a

[9] See paragraph 25 of the UNFCCC reporting guidelines.

fee and rebate system was not planned. Instead, tax rates were reduced in some sectors (e.g. transport). The review team noted that the design of an optimal mix of policy instruments for Greece's energy system in the near future was subject to ongoing discussions and research activities.

C. Energy

42. ***Institutional arrangements:*** The formulation of energy policies is within the competence of the Ministry of Development. It has joint responsibility with the MEPPPW for policies addressing energy use in buildings, and with the Ministry for Transport and Communications for transport policies. Since 1989, the Centre for Renewable Energy Sources (CRES) has been the national institute for renewable energy sources, rational use of energy and energy savings.

43. In 2002, the energy sector accounted for 77.0 per cent of total GHG emissions. Between 1990 and 2002, emissions from this sector increased by 28.3 per cent. Important sub-categories of this sector included energy industries (see section III.C.1), energy use in the residential and commercial sector (see section III.C.2), energy use in industry (see section III.D) and energy use in transport (see section III.E).

1. Energy industries

44. In 2002, emissions from energy industries, including fugitive emissions, accounted for 43.7 per cent of total GHG emissions. This relatively high share reflected the high proportion of fossil fuels used in electricity production. Between 1990 and 2002, emissions from this sub-category increased by 27.6 per cent.

45. During 1990–2003, electricity generation increased by 67 per cent, while its carbon intensity declined by 21 per cent. The review team noted that this decline in carbon intensity was achieved primarily by introducing natural gas and increasing its share, supported by the promotion of RES, combined heat and power (CHP) and energy efficiency measures. Producing electricity from nuclear energy was not seen as an option for Greece.

46. ***Financial support to investments energy projects:*** During 1994–2001, the Operational Programme for Energy (OPE) was the main financial instrument. One third of its total budget of EUR 1.116 billion derived from the second CSF. Energy-efficiency investments were subsidized at 45 per cent of the project costs, CHP investments at 35 per cent and RES investments at 55 per cent. In addition, the European Investment Bank supported several OPE projects with loans of up to 50 per cent of the project costs.

47. Under the third CSF, OPE was replaced by the Operational Programme for Competitiveness (OPC) for the project period 2000–2006. After two calls during 2001–2003, 276 proposals for RES, CHP and energy-efficiency projects were approved, with a total budget of EUR 1,032 billion. Investments in RES and CHP with a total capacity of 930 MW and electricity production of 3.4 TWh were subsidized at 30–50 per cent of the eligible costs. The review team was informed that OPC-funded projects are estimated to reduce CO_2 emissions by 3.95 Mt in 2010.

48. Furthermore, the Development Law 2601/1998 granted public financing of up to 30 per cent of the eligible costs to investments in RES and CHP, with a total capacity of 600 MW until 2010. It also provided financial support to investments in energy saving in the industrial and services sectors.

49. ***Promotion of natural gas:*** Since 1997, Greece has supported the supply and use of natural gas both institutionally and financially. State subsidies for the introduction of natural gas amounted to EUR 2.5 billion during 1997–2001. Natural gas is exempt from excise duty until the beginning of 2014 (Law 3336/2005) and benefits from a reduced VAT rate of 8 per cent. The Public Gas Corporation DEPA is owned by the Greek State (65 per cent) and the Hellenic Petroleum Corporation (35 per cent).

The liberalization of the electricity market is expected to give rise to a further penetration of natural gas in the near future, as 98 per cent of the approved licenses for electricity generation by thermal units relate to natural gas power plants. The promotion of natural gas in electricity generation was estimated to reduce GHG emissions by 9.64 Mt CO_2 equivalent in 2010; plans to further increase these efforts would result in emission reductions of additional 3.35 Mt CO_2 equivalent.

50. Several measures were implemented to diversify the supply of natural gas, contributing to the overall objective of energy security. Natural gas is imported from Russia (75 per cent) and from Algeria (25 per cent, as liquefied natural gas) and is expected to replace mainly imported oil in the national energy balance. The review team noted that a further increase in the use of natural gas might conflict with the policy target of reducing energy imports, which presently account for 66 per cent of total domestic energy consumption.

51. ***Electricity from RES:*** In 2003, RES electricity generation accounted for 11.5 per cent of total electricity consumption, and consisted of 84.5 per cent hydro power, 13.5 per cent wind power and 2.0 per cent biogas. RES electricity production in Greece was very sensitive to weather conditions; high rainfall in 2003 resulted in a relatively high share of hydro power.

52. The Ministry for Development considered the exploitation of RES to be among its energy policy priorities. The OPE and Development Law provided investment cost subsidies, in combination with Law 2244/94-, which established favourable feed-in tariffs for electricity generated from RES. Electricity is exempt from excise duty until the beginning of 2010 (Law 3336/2005). By 2003, the Development Law had financed 20 wind-energy projects and 12 small hydro projects with installed capacities of 175 MW and 3.5 MW respectively. The OPE financed more than 140 RES projects with a total installed capacity of more than 190 MW. The mitigation effect of adopted polices and measures to promote RES in electricity generation was estimated at 2.11 Mt CO_2 equivalent; planned policies and measures would further reduce emissions by 4.4. Mt CO_2 equivalent.

53. In the context of EU Directive 2001/77/EC for the promotion of electricity produced by renewable energy sources in the internal electricity market, an indicative target of 20.1 per cent for the production of electricity from RES was set for the year 2010. During its visit to Athens, the review team was provided with two projections for the share of RES in the electricity production by 2010: 14.4 per cent under conservative assumptions and 19.8 per cent under optimistic assumptions. The review team therefore concluded that, in spite of sufficient potential for RES, the indicative target was not expected to be met without additional measures.

54. ***Improvements in the conventional power system:*** Policies and measures in this field include efficiency improvements in the existing lignite-fired power plants, the limitation of distribution losses, and the promotion of CHP. The PPC (as the owner of most conventional power plants in Greece) has been actively involved in these fields of energy conservation, and has initiated the implementation of a cogeneration programme in its lignite-fired power plants by setting up a district heating network in northern Greece. The total estimated effect of these measures amounted to 0.55 Mt CO_2 equivalent.

2. Energy use in the residential and commercial sector

55. In 2002, energy use in the residential and commercial sector accounted for 9.8 per cent of total GHG emissions. Between 1990 and 2002, emissions from this sub-category increased by 52.9 per cent, mainly as a result of improved living standards and an increased number of dwellings (see paragraph 27). These two factors were the main drivers for increased energy demand for space heating and cooling, and for an increased number of domestic electrical appliances and equipment. Thermal insulation of

buildings, solar heating units and the replacement of inefficient appliances were factors that helped to reduce the rate of increase.

56. Generally, the ***implementation of several EU directives***, relating to energy efficiency in buildings (Directive 2002/91/EC and former SAVE Directive 93/76/EC), energy efficiency standards for non-industrial boilers and for refrigerators (Directives 92/42/EC and 96/57/EC respectively) and energy labelling for household appliances (Directive 92/75/EC) is expected to gradually improve the demand-side efficiency of residential heating and other energy use in this sector over the coming decades.

57. ***Improvements in the thermal behaviour of existing buildings:*** The retrofit measures examined concerned roof insulation in residential buildings (10 per cent of existing buildings), as this is more cost-efficient and easier than wall insulation, and replacement of single glazing by double glazing in commercial buildings.

58. ***Promotion of energy-efficient appliances and heating equipment:*** Several promotion measures were expected to increase the market share of energy-efficient appliances (including air-conditioning units) considerably, up to 40 per cent of the projected stock of appliances. Energy-efficiency improvements of heating equipment were addressed by systematic maintenance and the replacement of central-heating boilers.

59. Other energy conservation measures include reduction of the cooling load through external shading of buildings, night ventilation and use of roof fans, as well as the reduction of electricity consumption for lighting through the use of advanced lighting control systems. The mitigation effect of planned measures to promote the replacement of incandescent lamps was estimated at 1.5 Mt CO_2 equivalent.

60. Emission reductions in this sector were estimated at 4.1 Mt CO_2 equivalent in 2010. The review team noted that the NC3 did not provide an estimate for the total technical potential for energy conservation by sectors, and corresponding GHG reduction potential. The review team also noted that a strong monitoring and evaluation system would be needed in order to ensure the full exploitation of the energy conservation potential. Delays in the legislative process, the application of an unbalanced mix of policy instruments, and incomplete implementation of policies and measures may reduce their overall effectiveness.

D. Industry

61. In 2002, energy use in manufacturing industries and construction accounted for 7.9 per cent of total GHG emissions, while emissions from industrial processes (including use of solvents and other products and emissions of fluorinated gases) accounted for 9.1 per cent. Between 1990 and 2002, emissions from these two sub-categories increased by 3.7 per cent and 49.6 per cent respectively.

62. ***Energy use in industry:*** Energy-efficiency improvements in various areas of the industry sector are promoted through several legislative acts, including the Development Law, law 2244/93 (for CHP plants), the Operational Programme for Energy (OPE), and the Operational Programme for Competitiveness (OPC). Both energy-intensive and small- or medium-sized enterprises are addressed. Apart from CHP plants, a number of energy conservation projects have been funded, 161 of which were already completed. With 4.4 Mt CO_2 equivalent in 2010, the largest mitigation effect of implemented measures in this sector is estimated for the promotion of thermal use of natural gas in industry.

63. A 15 per cent increase in the penetration of natural gas in industry (compared to a "with measures" scenario), the promotion of solar energy in industry, the use of biomass in wood processing

units and food industries, and various energy conservation measures are reported as planned policies and measures in this sector. The mitigation effect of planned measures is estimated at 0.4 Mt CO_2 equivalent in 2010.

64. ***Industrial processes:*** Direct GHG emissions from industrial processes in 2002 were reported as follows: CO_2 from mineral products, mainly cement production, (5.4 per cent of total), HFCs from HCFC-22 production (2.4 per cent of total), HFCs from HFC consumption (0.6 per cent of total) in residential refrigeration and air-conditioning, and N_2O from chemical industries (0.4 per cent of total).

65. Two planned measures were reported in the NC3. The first is the closure of a HCFC-22 production plant before 2008, which is estimated to reduce emissions by 3.7 Mt CO_2 equivalent per year. During the visit to Athens, the review team was informed that the plant was constantly reducing production according to international and EU environmental obligations but closure plans did not exist. The review team noted that postponing these closure plans would result in a reduced mitigation effect.

66. The second measure is the recovery of fluorinated gases from discarded equipment, with an estimated mitigation effect of 0.9 Mt CO_2 equivalent in 2010. The review team was informed of an ongoing project to organize the recovery of fluorinated gases. Furthermore, the implementation of a proposed EU-wide regulation on certain fluorinated gases is expected to support efforts in this field.

67. Emissions of CO_2 from cement production increased by 33 per cent between 1990 and 2002. The review team noted that although mitigation measures for this sub-category were not in place or planned, emissions from cement production were projected to remain stable between 2002 and 2010. The review team was informed that these projections were based on the assumption, in view of ETS constraints, that cement or clinker would be imported in the likely case of continued increases in cement consumption up to 2010.

E. Transport

68. In 2002, fuel combustion in domestic transport accounted for 15.5 per cent of total GHG emissions, while emissions from international bunker fuels (mainly marine transport) equalled 9.1 per cent.[10] Transport is one of the fastest-growing sectors: between 1990 and 2002, emissions from these two sub-categories increased by 33.7 per cent and 16.6 per cent respectively.

69. ***Transport activity:*** Road infrastructure and the fleet of road vehicles grew rapidly during the 1990s. Modernization of transport infrastructure, for both public and private transport, was funded to a large extent by the EU. Between 1990 and 2002, the number of registered passenger cars and heavy-duty vehicles more than doubled (+116 per cent and +141 per cent respectively). In 2000, motorcycles made up a large share (15.4 per cent) of total motor vehicles, as a result of restrictions and limitations on passenger car use in Athens, in combination with inadequate public transport services. Because of their effect on air quality, the use of diesel vehicles is prohibited in the three biggest cities: Athens, Thessaloniki and Piraeus.

70. ***Energy efficiency in transport:*** The NC3 reported the EU voluntary agreement with car manufacturers (ACEA/JAMA/KAMA) as the most effective adopted sectoral measure. The estimated effect (365 kt CO_2 in 2010) assumed an average emission level of newly sold passenger cars of 140 g/km in 2008. The review team noted that meeting this target in Greece will be challenging, given the restrictions for diesel vehicles in its major cities.

[10] Emissions from international bunker fuels were not included in the national totals.

71. ***Promotion of public transport:*** Further implemented policies include the construction of metro lines, renewal of bus fleets and measures to speed up public transport. Reported planned measures include the promotion of public transport through public investments, with an estimated mitigation effect of 461 kt CO_2 in 2010.

72. ***Shift to lower-carbon fuels in transport:*** The promotion of biofuels – two new bio-diesel plants were established in 2005 – and the use of compressed natural gas (CNG) for bus fleets are more recent measures based on the EU directive for the promotion of biofuels. Law 3340/2005 introduces the exemption from excise duty for certain amounts of bio-diesel. The implementation of this provision is the subject of a Common Ministerial decision, which is being developed by the competent ministries in late 2005.

F. Agriculture

73. In 2002, agriculture (without CO_2 emissions from agricultural soils) accounted for 9.4 per cent of total GHG emissions. It accounted for 31.6 per cent of total CH_4 emissions, mainly from enteric fermentation of animals, and for 65.2 per cent of N_2O emissions, mainly from the use of nitrogen fertilizer on agricultural soils. Between 1990 and 2002, GHG emissions from this sector decreased by 6.4 per cent.

74. Between 1995 and 2000, agriculture covered 29–30 per cent of total land area, whereas irrigable land increased from 30 to 37 per cent during 1990–1998. In 2000, the total agricultural land comprised arable land (54.9 per cent), permanent crops (27.8 per cent), and grassland and pastures (16.9 per cent). The use of synthetic nitrogen fertilizers decreased by 24 per cent during 1990–2000, while livestock populations remained broadly unchanged. These effects were the main drivers behind the decrease in sectoral GHG emissions.

75. Implemented or adopted policies and measures in agriculture were not reported in the NC3. During its visit to Athens the review team was informed that some provisions of the EU Common Agricultural Policy had resulted in restrictions on agricultural activity.

76. Better manure management and the use of organic farming practices were reported as planned policies in this sector. The mitigation effect of these planned policies was estimated at 0.1 Mt CO_2 equivalent.

77. ***Mitigation component of policies in agriculture and forestry:*** Although no methodological problems were encountered in estimating emissions from agriculture and LUCF, the review team noted that their role in the CO_2 balance has yet to be determined. A full assessment of the potential for emission reductions in agriculture and LUCF has not been carried out, as was outlined in the NC2. However, the monitoring and evaluation of potential emission reductions could be realized through the registration of forests, which has recently begun.

78. The review team noted the lack of a coherent effort to address climate change issues and mitigation measures in agriculture and forestry. Apart from marginally addressing N_2O emissions from agricultural soils, little or no attention was paid to CO_2 emissions and sequestration from agricultural soils or CH_4 emissions from enteric fermentation in animals.

G. Land-use change and forestry

79. Net GHG emissions from land-use change and forestry (LUCF) totalled 1,607 Gg CO_2 equivalent in 1990 and 4,587 Gg CO_2 equivalent in 2000, whereas in 2001 and 2002 the net removals from this

sector equalled 1,233 Gg and 1,883 Gg CO_2 equivalent, respectively. Emissions of CO_2 from LUCF in 1990 and 2000 were largely attributed to forest fires (forest and grassland conversion).

80. ***Analysis of activity data:*** Closed forests comprised 19 per cent of the total land area, with the concomitant problems of forest fires, grazing of steep slopes and low rates of reforestation, all of which further contributed to soil erosion and desertification. In 1999, 810,000 m^3 of round logs were extracted from the forests (50 per cent more than in 1992), as well as resin gum (+180 per cent), firewood (+15 per cent) and charcoal (+10 per cent).

81. ***Afforestation, reforestation and deforestation:*** No implemented or adopted policies and measures were reported in the LUCF sector. Planned policies and measures included those within the framework of EU directives on the management and protection of public and private forests.

H. Waste management

82. In 2002, GHG emissions from waste management (including waste-water handling) accounted for 4.5 per cent of total GHG emissions. It accounted for 49.5 per cent of total CH_4 emissions, mainly from solid waste disposal on land, and for 2.7 per cent of N_2O emissions, mainly from waste-water handling. Between 1990 and 2002, GHG emissions from this sector increased by 44.4 per cent.

83. ***Solid waste disposal:*** The requirements under the EU Landfill Directive were introduced into Greek law JMD 29407/3508/2002, which also provides for postponement of the national targets for reducing biodegradable waste.[11] In 2004, CH_4 collected from municipal solid waste disposal sites (MSWDS), covering about 80 per cent of total managed MSWDS, was flared; using CH_4 collected from MSWDS for energy production was still in the planning stage. The review team was informed that waste incineration is not considered an option for Greece because of the negative public perception of this technology. Instead, Greece plans to establish six new treatment plants for organic waste by 2010.

84. The implementation of the EU Landfill Directive was estimated to reduce emissions from this sector by 5.9 Mt CO_2 equivalent by 2010. The review team noted that, although additional information was provided during and after the country visit, important background information, such as current levels of biodegradable waste and current and projected CH_4 recovery from landfills, was not available. Therefore, the review team was unable to evaluate the estimated mitigation effect.

85. ***Waste-water treatment:*** The construction of municipal waste-water plants and CH_4 recovery from waste-water treatment were reported as adopted measures in this field. In 2000, 32 per cent of the population was served by waste-water treatment. In 2002, 71 per cent of the total population was connected to sewerage and 50 per cent to plants with special treatment, in compliance with the European Directive (91/271/EU). In 2004, 80 per cent of the total population was considered to be connected to sewerage with secondary treatment; by 2006 this figure is projected to increase to 95 per cent. Because of an increase in aerobic waste-water treatment plants and CH_4 recovery, emissions are projected to decline by 89 per cent during 2000–2010.

86. According to the NSSD and in the context of the Sixth EU Environmental Action Programme, Greece has promoted further measures for the expansion and organization of related infrastructure, while delegating the responsibility of planning and management of waste to the administrative regions. Also, a National Plan for the Integrated and Alternative Management of Solid Waste has been drawn up and is being implemented. This plan aims at the safe disposal of waste and the maximization of recycling, as well as a reduction in the total amount of solid waste in the long term. Education and training of local

[11] The NC3 reports on targets for reducing biodegradable waste for the year 2006 (–25 per cent), 2009 (–50 per cent) and 2013 (–65 per cent), based on the amount of waste produced in 1995.

municipalities and raising the awareness of decision-makers and the general public completes the national waste management policy.

IV. PROJECTIONS AND THE TOTAL EFFECT OF POLICIES AND MEASURES

A. Reporting on projections

87. ***Institutional framework:*** The MEPPPW is responsible for coordinating the preparation of projections for the NC3. The Ministry of Development is responsible for the preparation of projections on energy demand and supply. The Ministry of Economy and Finance is responsible for the macroeconomic forecast, which is based on Government strategy. The macroeconomic forecast is compiled using inputs from all ministries. The NC3 projections on GHG emissions were prepared by the NOA.

88. ***Coverage:*** The NC3 provides two projections of future levels of GHG emissions, based on modelling and spreadsheet calculations. It includes projections by gas and by sector, and also projections of overall emission levels. The review team noted that reporting on projections broadly complied with the requirements of the UNFCCC reporting guidelines. In particular, projections cover all sectors and GHGs (CO_2, CH_4, N_2O and fluorinated gases). Projections for the transport sector were included in the energy sector. The time horizon for projections was 2020 in the "with measures" scenario and 2010 in the "with additional measures" scenario. The emission levels were projected for the years 2005, 2010, 2015 and 2020. The GHG emissions from LUCF were assumed to remain unchanged in the period 2005-2020.

89. The review team acknowledged that projections are broadly consistent with the inventory data. The base year for these projections is 2000. Inventory and projection data are represented jointly in sectoral diagrams, as requested by the UNFCCC guidelines. The overall GHG emissions are presented as a total, and expressed in CO_2 equivalent, using the IPCC default global warming potential (GWP) factors.

90. ***Updated projections:*** In May 2005, the review team was provided with an updated set of projections of GHG emissions until 2020, hereinafter called the 2005 projections. They were based on the same scenario and modelling approach as the NC3 projections, but on slightly changed assumptions (see paragraph 97). Furthermore, recalculations in the inventory, the inclusion of additional sources (e.g. industrial waste water, indirect N_2O emissions from agriculture), and improvements in the energy modelling framework (e.g. more analytical simulation of some sectors in the economic-technical energy optimization model ENPEP) resulted in slight increases in the projected GHG emission levels. The 2005 projections were developed in the context of Greece's NAP for the EU-ETS (see paragraphs 16 and 39).

B. Scenarios, models and assumptions underlying future emission trends

91. Two scenarios were presented, taking into account two different levels of implementation of policies and measures. The "with measures" scenario covered all adopted and implemented policies and measures as described in section III of this report. The total effect of these policies and measures was estimated at 26.2 Mt CO_2 equivalent in 2010 and 34.8 Mt CO_2 equivalent in 2015, without taking into account possible interferences between these measures. Two thirds of this total effect was attributed to the promotion of natural gas in Greece's energy system.

92. The "with additional measures" scenario was constructed as an extended "with measures" scenario, as it included the mitigation effects from all adopted and implemented measures, as well as from planned measures as defined in the context of the NPCC2. The total effect of these planned policies and measures was estimated at 16.4 Mt CO_2 equivalent in 2010 and 21.9 Mt CO_2 equivalent in

2015, without taking into account possible interferences between these measures.[12] One third of this total effect is attributed to measures in electricity production, including a further penetration of RES and CHP as well as the exploitation of natural gas-combined cycle power plants as base load units. Further important planned measures addressed emissions from industrial processes (restructuring of the operation of chemical industries and recovery of fluorinated gases from discarded equipment) and from energy use in the residential and commercial sector (see paragraph 56). The review team noted that the aim of the "with additional measures" scenario was to show that the Kyoto target could be fully met by the implementation of additional domestic policies and measures.

93. ***Methodology:*** Because of the high share of the energy sector (77 per cent of total GHG emissions in 2002) a comprehensive approach was taken to prepare projections for this sector. The projections on emissions from energy and transport were based on calculations made using ENPEP. Energy demand was modelled in six sectors, including agriculture, industry, residential, services, transport and non-energy uses.

94. Projections of GHG emissions from non-energy sectors were based on spreadsheet models. Future changes in activity data were mainly derived from statistical analysis, while changes in emission factors were derived from expert assessments based on the IPCC/CORINAIR methodology.

95. ***Assumptions underlying future emission trends:*** The "with measures" and "with additional measures" scenarios were both based on the same set of assumptions that was reported transparently in the NC3 (see table 8). The review team noted that the assumed rates for growth in population and GDP were broadly consistent with historic growth rates observed during 2000–2002 (see table 1), while the assumed decreases in oil and gas prices might result in an overestimation of the use of these energy sources.

Table 8. Main assumptions underlying future emission trends

	Historic values			Projected growth rates (%)			
	1990	1995	2000	2000–2005	2005–2010	2010–2015	2015–2020
Population (mio)	10.16	10.53	10.87	0.5	0.4	0.3	0.2
Household size (cap/hh)	3.21	3.14	3.06	-0.7	-0.8	-0.8	-0.8
GDP (billions of EUR 2000)	96.6	102.8	121.0	4.4	3.4	3.0	2.9
Coal price ($90/tonne)	51.3	40.6	28.5		31.2[a]		
Oil price ($90/bbl)	22.2	17.2	22.8	-7.7	0.0	0.8	3.1
Natural gas price ($90/toe)	119.1	92.5	90.1	-7.7	0.0	0.8	3.1
Passenger transport (bil. p-km)[b]	96.5	124.3	151.4	3.3	2.3	1.7	1.0
Freight transport (bil. t-km)[c]	84.8	94.3	106.0	2.6	2.3	2.1	1.9

[a] Absolute value.
[b] Billions of passenger-kilometres.
[c] Billions of tonne-kilometres.

96. Gross domestic energy consumption was assumed to increase by 44 per cent during 2000–2020, with major increases in liquid fuels and natural gas. Final energy demand was assumed to increase by approximately 42 per cent until 2020, with major increases in the transport, industry and services sectors, and broadly constant levels in the agriculture and the residential sectors. Net electricity generation was assumed to increase by 72 per cent until 2020, with major increases in natural gas and wind energy.

97. The set of assumptions used for the 2005 projections included lower GDP growth rates (3.9 per cent) during 2000–2005, higher oil and gas prices, and higher growth rates for passenger

[12] The review team was informed that the total effect applied for the measures in the "with additional measures" scenario was 30 per cent below their estimated technical mitigation potential.

transport (3.0 per cent during 2005–2010) and freight transport (3.1 per cent during 2000–2005 and 2.9 per cent during 2005–2010).

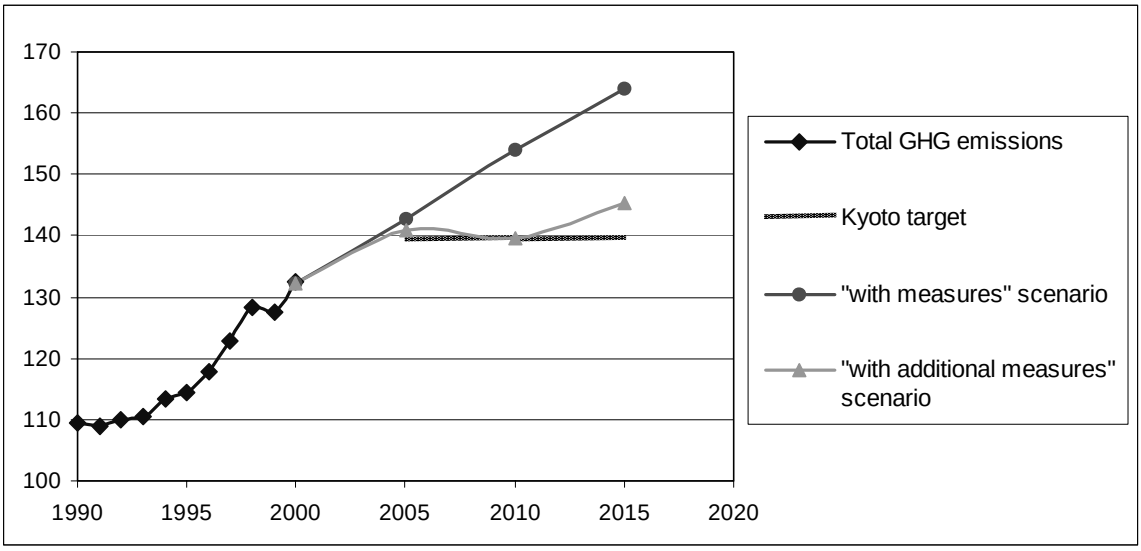
98. The review team noted that the transposition of the EU directive on emissions trading into national law was assumed not to affect the projected emission trends, as the participating entities are expected to achieve these reductions in CO_2 emissions through the implementation of additional domestic measures in the framework of the NPCC2, as reflected in the "with additional measures" scenario. According to the NAP, the number of total allowances was 2.1 per cent below the CO_2 emissions in the "with measures" scenario for the period 2005–2007.

C. Results of projections

99. ***Results:*** On a "with measures" basis, total GHG emissions were estimated in the 2005 projections to increase by 41 per cent, from 109.4 Mt CO_2 equivalent in 1990 to 154.1 Mt CO_2 equivalent in 2010 (see figure 2). The Kyoto target, calculated as 125 per cent of the base year value (see paragraph 14), was 139.7 Mt CO_2 equivalent. The resulting emissions gap for the first commitment period was calculated as 14.4 Mt CO_2 equivalent, which equals 12.9 per cent of the base year emissions (and 13.2 per cent of the 1990 emissions). Beyond the first commitment period, emissions are projected to further increase to 163.9 Mt CO_2 equivalent by 2015. This would mean a 50 per cent increase in total GHG emissions during 1990–2015.

100. ***Comparison with NC3 projections:*** The review team noted that the 2005 projection showed a considerably higher emission level than the NC3 projections. The "with measures" scenario presented in the NC3 projections showed a 35.8 per cent increase by 2010 and a resulting gap of 11.7 Mt CO_2 equivalent.

Figure 2. Results of the 2005 projections of total GHG emissions (Mt CO_2 equivalent)



101. The "with additional measures" scenario shows a slight decline in total GHG emissions during 2005–2010, down to the level of the Kyoto target in 2010. Thereafter, emissions are projected to further increase to 145.3 Mt CO_2 equivalent by 2015. This would mean a 33 per cent increase of total GHG emissions during 1990–2015. The results of the "with additional measures" scenario presented in the

2005 projections were in line with those of the "with additional measures" scenario, as presented in the NC3 projections.

102. Projected emissions by sector and the changes in historic emissions since 1990 are shown in table 9. In the "with measures" scenario, emissions from the energy sector – which constituted 75.6 per cent of total GHG emissions in 1990 – and from industrial processes were projected to rise sharply until 2010, by 49 per cent and 88 per cent respectively. Declines in emissions from waste, and to a lesser extent from agriculture and solvent use, moderated the growth in total GHG emissions only slightly. The review team noted that longer-term effects of adopted or implemented policies and measures were not visible – the near linear growth trend in overall emissions is projected to continue beyond the first commitment period.

Table 9. Projected GHG emissions by sector, in kt CO_2 equivalent

Sector	1990	1995	2000	2005		2010		2015	
				WM[a]	WAM	WM	WAM	WM	WAM
Energy	81 704	84 634	101 611	111 041	109 430	121 671	112 171	129 910	117 362
Industrial processes	86 70	11 400	12 810	14 079	14 079	16 323	116 72	18 906	132 06
Solvents use	170	153	145	158	158	161	161	164	164
Agriculture	13 514	12 489	12 330	12 075	12 036	12 184	12 053	12 304	12 150
Waste	5 357	5 811	5 429	5 365	5 287	3 723	3 552	2 593	2 464
Total	**109 415**	**114 487**	**132 325**	**142 718**	**140 990**	**154 062**	**139 609**	**163 877**	**145 346**
Change from base year levels	98.0	102.5	118.5	127.8	126.3	138.0	125.0	146.7	130.2

a WM = with measures; WAM = with additional measures.

103. ***Sensitivity to key variables:*** The 2005 projections contained a sensitivity analysis based on simulations of Greece's energy system. Additional ENPEP model runs investigated changes in the energy system and the effect of different assumptions. Two scenarios were modelled: a "Carbon Tax Scenario" (CTS), simulating an environmental tax on GHG emissions from the production and consumption of energy, and a "Weak Growth Rate Scenario" (WGRS), simulating significantly lower rates of economic development for Greece's economy. The review team noted that the introduction of a carbon tax was not discussed in the context of the NPCC2 (see paragraph 41).

104. The results of this analysis showed that the implementation of a carbon tax equivalent to USD 42 per tonne CO_2 would impose significant changes in the structure of the energy system and would lead to considerable reductions in GHG emissions, as compared to the "with measures" scenario. In the CTS scenario, emissions from the energy sector would increase only by 33.9 per cent above base year levels in 2010. In the WGRS scenario, assumed lower GDP growth rates (of 3 per cent during the period 2005–2010, and 2.7 per cent during 2010–2015) would result in a slightly smaller increase rate of 46.9 per cent in 2010, when compared to the "with measures" scenario increase rate of 49 per cent.

105. Based on the results of the "with measures" and the "with additional measures" scenarios, and of the CTS and WGRS scenarios, as presented in the 2005 projections, the review team concluded that meeting the Kyoto Protocol target (see paragraph 14) through the implementation of domestic actions alone will be challenging for Greece, even if all adopted and planned policies and measures are thoroughly implemented (see footnote 12), and if the key assumptions materialize as described above.

V. VULNERABILITY ASSESSMENT, CLIMATE CHANGE IMPACTS AND ADAPTATION MEASURES

106. The NC3 reporting on vulnerability assessment complied with the UNFCCC reporting guidelines and identified water resources, agriculture, forests and biodiversity as being vulnerable to climate change. Some adaptation options were listed for each of the vulnerable sectors, however no specific evaluations of adaptation options were carried out, as much of the discussion on adaptation was reported within the context of the responses to other Rio Conventions (e.g. the United Nations Convention to Combat Desertification and the United Nations Convention on Biological Diversity).

107. Evidence from meteorological observations indicated that in Greece during the last decade the temperature has increased, while there has been a decrease in precipitation. There is evidence of more frequent incidence of heat waves and higher maximum temperatures. A 1–2 mm increase in sea level per year was recorded for the Mediterranean coast.

108. The review team noted that model simulations of future climate change for Greece show an increase in temperature of between 3.3° C (for emissions scenario B2) and 4.8° C (for emissions scenario A2) by 2100. With respect to precipitation, model projections show a significant likelihood for an increase in northern Greece. The impact of climate change on extreme weather events was found to indicate an increase in frequency of droughts, for example. The sea-level rise was projected to be 50 mm per decade by 2100. The review team noted that the impacts of this sea-level rise on the long coastline of Greece have not been assessed yet, although work is already in process to do so.

VI. FINANCIAL RESOURCES AND TRANSFER OF TECHNOLOGY

109. Greece plays a considerable role in assisting developing countries and countries with economies in transition by providing financial aid through its well-developed multilateral and bilateral development assistance. The overall responsibility lies with the Ministry of Economy and Finance which allocates the contributions of Greece to multilateral economic and financial organizations such as the World Bank, the European Bank for Reconstruction and Development (EBRD), the Global Environment Facility (GEF) Trust Funds and the United Nations Development Programme.

110. As reported in the NC3, Greece's contribution to the GEF amounted to USD 4.88 million between 1997 and 2000 for specific projects and programmes. In addition, Greece contributed USD 5.5 million to the second replenishment of the GEF and was committed, in 2002, to contribute EUR 5.73 million to the third replenishment of the GEF, allocated in four equal instalments, for the period 2002–2006. Together with contributions to other multilateral financial institutions, Greece's contributions between 1997 and 2000 totalled USD 27.65 million, 70 per cent of which was directed towards the World Bank and the EBRD.

111. Greece's net bilateral official development aid disbursements have increased almost fourfold from USD 27 million to USD 99 million since 1996. In the year 2000 its total (multilateral and bilateral) net official development aid disbursements were USD 226 million, representing 0.2 per cent of its gross national income. Greece's contribution to bilateral development assistance is centred on its geographic region, and its security and welfare, which are closely aligned with stability and economic prosperity in the countries of the Balkans, the Black Sea and the eastern Mediterranean.

112. The MEPPPW has implemented a bilateral programme of development assistance and cooperation in the field of environment and sustainable development in the Balkan, Black Sea and eastern Mediterranean. In 1999, 22 projects totalling EUR 1.87 million were carried out in the fields of spatial development, water resource conservation and management, protection of the atmosphere and natural environment, water and waste management, promotion of adaptation measures in the water

resources sector, reduction and monitoring of emissions of volatile organic compounds. Additionally, in 2000, 38 new projects worth EUR 6.16 million were planned to be implemented over a two-year period in the same regions; out of these, six projects, representing 18 per cent of the total 2000 budget, focused on assisting the efforts of six Balkan countries to develop the required capacities, infrastructure and institutions to address climate change in the framework of the Kyoto Protocol requirements, including an assessment of possibilities for developing the project-based mechanisms (joint implementation, clean development mechanism) between Greece and partner countries.

113. Contributions to United Nations conventions and their secretariats are channelled through various competent ministries. The MEPPPW makes annual contributions of around USD 86,000 to the Trust Fund for the Core Budget of the UNFCCC; over the period 2000 to 2004 Greece contributed USD 10,000 annually to the Trust Fund for Participation in the UNFCCC Process; in 2005 it contributed around USD 35,000 to support the implementation of the Kyoto Protocol.

114. The review team found that reporting on the provision of financial resources in the NC3 generally followed the UNFCCC guidelines, with a high level of detail on bilateral and regional aid development assistance programmes. The review team also found that considerable financial support has been provided by Greece to bilateral and regional funding, as well as to multilateral institutions and programmes. Much of this support was reported to be motivated by the implementation of the Convention, although the share of new and additional support was not exactly estimated. Bilateral assistance and cooperation programmes mainly included capacity-building activities relating to the transfer of technology for limiting/reducing GHG emissions, implementation of the Convention, and preparations for effective participation in the Kyoto Protocol.

115. In the context of the Type II initiatives from the World Summit on Sustainable Development (WSSD) and the Johannesburg Plan of Implementation, Greece leads, funds, coordinates and participates in the assessment of climate change impacts in several African countries; this Type II initiative promoted by Greece contributes considerably to the implementation of the UNFCCC in Africa. Greece also leads the Mediterranean component of the EU Water Initiative, which was launched at the WSSD in 2002. The focus of this partnership is to assist with the design of better, demand-driven and output-oriented water programmes in the Mediterranean region, which involves the transfer of technology, capacity-building, and education and training.

VII. RESEARCH AND SYSTEMATIC OBSERVATION

116. The NC3 briefly reports on research activities relating to climate change carried out in Greece. The review team found this section of the NC3 to be in compliance with the requirements of the reporting guidelines.

117. ***Institutional arrangements:*** Within the framework of the third CSF and under the umbrella of the OPC, the General Secretariat for Research and Technology (GSRT) of the Ministry of Development supported projects promoting collaboration between business enterprises and research entities. In 1999, the overall amount spent for research equalled 0.68 per cent of GDP. The review team noted that two of the main GSRT research programmes were particularly related to climate change: “Natural Environment and Sustainable Development” (total budget EUR 32.7 million) and ”Renewable Energy Sources and Energy Saving” (total budget EUR 15.8 million).

118. ***Research:*** Climate-related research is carried out at two national research centres, the NOA and the National Centre for Marine Research (NCMR). In addition, most universities in Greece conduct meteorological and climatological research covering a wide range of subjects, as does a small group at

the Academy of Athens. Finally, the National Agricultural Research Foundation of the Ministry of Agriculture carries out research on the impacts of climate change on agricultural activities.

119. In 2001, the GSRT provided funds to the NOA for improving its modelling capability for both short-term prediction (3–5 days) and longer-term climatic forecasts (3–6 months). NOA is operating two mesoscale models for weather forecasting, which are being adapted for medium-length climatic forecasts (6 months). The NOA has also implemented and evaluated two additional regional climate models. The review team was informed that some climate research programmes in the field of modelling and impacts of climate change are planned, subject to funding.

120. In 2003, a Climate Change Observatory, comprising 15 researchers plus support staff, was established at the NOA. The review team was informed that its continuation is subject to availability of resources.

121. ***Systematic observation:*** The NC3 reports briefly on systematic observation. A separate Global Climate Observing System (GCOS) report was not compiled. The review team was informed that a GCOS report is envisaged in the context of submitting Greece's fourth national communication.

122. Headed by the Hellenic National Meteorological Service (HNMS), Greece takes part in the systematic observation of climate-related parameters in the fields of hydrology, oceanography, ground characteristics and landmass. The HNMS operates a network of 26 stations that provide meteorological data on a continuous basis to the international networks; all 26 stations were equipped with updated devices in 2003/4. Greece is a member of the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT) and the European Centre for Medium-Range Weather Forecasts (ECMWF), and supported neighbouring Balkan countries bilaterally in the establishment and operation of a monitoring network.

VIII. EDUCATION, TRAINING AND PUBLIC AWARENESS

123. The NC3 reports briefly on Article 6 activities in the fields of student/university/public education, and on public awareness and the role of non-governmental organizations (NGOs). The review team found this section of the NC3 to be in compliance with the requirements of the reporting guidelines.

124. Greece participated in several international programmes concerning environmental education for students, and environmental education has been introduced as a specific course mainly in the Education faculties of universities. Moreover, the Ministry of Education and Religious Affairs has incorporated into its planning the establishment of 20 Centres of Environmental Education throughout the country. Services at these centres include special programmes of environmental education for groups of students, training seminars for teachers and other interested population groups, the publication of tutorial material, coordinating networks for environmental education and cooperation with the regional administration, universities and environmental organizations at the national and international level.

125. School and university curricula provide an understanding of environmental problems and actions, and include references to climate change and its impacts. Important aspects of climate policy and GHG mitigation, including energy security, energy conservation and RES, are in the list of curricula topics. The WEPPPW organizes campaigns and distributes leaflets with specific reference to climate change. The CRES, the PPC and other industry players actively integrate public information activities in their environmental performance, e.g. through the publication and dissemination of informational materials.

126. In 2000, the National Centre for Environment and Sustainable Development (NCESD) was established, under the supervision of the MEPPPW, with the objective of assisting the preparation of environmental policies. In general, the involvement of the NCESD in environmental policy issues is

related to the collection, evaluation, diffusion and updating of environmental information; the development of a network of all entities involved in environmental awareness; the fulfilment of Greece's international commitments concerning issues of environmental awareness and education (e. g. RIO+10); and the submission of specific proposals to decision centres, aiming at the promotion of environmental awareness and education and consolidation of their positive results.

127. Public participation in addressing climate change takes place through a number of environmental and business NGOs. Press articles, TV and radio programmes, TV commercials, brochures, CD ROMs and other media have been used to raise public awareness of climate change impacts and GHG mitigation (e.g. energy efficiency, use of public transport). The level of public awareness of climate change in Greece's population has not been investigated, but national representatives reported it to have risen due to the occurrence of extreme weather events internationally.

IX. CONCLUSIONS

128. The review of the third national communication of Greece and the additional information provided during the visit to Athens allowed the review team to conclude that Greece's NC3 is a comprehensive document that well reflected the status of Greece's climate change policy at the time it was prepared and published. It covered all important aspects of Greece's climate change policy at the time it was prepared and published.

129. In general, the NC3 broadly complied with the structure laid down in the revised UNFCCC reporting guidelines. Some potentials for increasing the completeness and transparency of reporting were identified, especially in the chapter on inventories (completeness, analysis of drivers behind trends, see paragraph 19), policies and measures (how policies and measures are modifying longer-term trends, see paragraph 36), and vulnerability and impact assessment (see paragraph 106). The review team noted that the main barriers that prevented the full use of these potentials in Greece are limited capacity and unclear responsibilities of the actors involved in the implementation of climate change policy.

130. During the review, the team analysed the information provided in the NC3 together with data from the 2004 inventory submission of Greece to the UNFCCC secretariat, which contains data on emission trends for the period 1990–2002. The results of this analysis suggest that Greece hardly contributed to achieving the aim of the Convention, as its total GHG emissions increased by 22.3 per cent in the period from 1990 to 2000, without considering CO_2 from LUCF, and by 24.4 per cent, if CO_2 from LUCF is considered. The review team also noted that the national target of limiting the increase in CO_2, CH_4 and N_2O emissions to 15±3 per cent during 1990–2000, as set in the 1995 National Action Plan on Climate Change (NAPCC), was not achieved.

131. In May 2002, Greece ratified the Kyoto Protocol jointly with the other EU member States, thus committing itself to keeping its average annual emissions of GHGs during the first commitment period (2008–2012) below 125 per cent of the base year level. Based on the results of the 2005 projections presented by Greece, the review team concluded that meeting the Kyoto Protocol target (see paragraph 14) through the implementation of domestic actions alone will be challenging for Greece, even if all adopted and planned policies and measures are thoroughly implemented (see footnote 12), and if the key assumptions materialize as described above. The review team was informed that Greece continues to be determined to meet its Kyoto Protocol target.

132. The review team noted that, in conjunction with the ratification of the Kyoto Protocol, the Second National Programme on Climate Change (NPCC2) was adopted in May 2002 and approved by the Council of Ministers in February 2003. The NPCC2 aimed at achieving the Kyoto target and mainly

built on cost-effective polices and measures that were already integral parts of sectoral policies, including the promotion of natural gas, RES and energy efficiency.

133. According to the NSSD, Greece considers climate change to be one of the major environmental hazards, as the pressures of desertification, water scarcity and temperature rise are already visible in the country. Besides the aim of economic development, the 2002 NSSD has three main objectives: environmental protection, social cohesion and the integration of sectoral policies. Mitigation of climate change is one of six central targets identified in the NSSD and one of seven "sectors of action and measures" for the reduction of environmental pressures in Greece (see paragraph 15).

134. A number of the adopted policies and measures were primarily motivated by reasons other than climate change. One of the key drivers for the implementation of energy, environmental and climate change policies is the transposition of EU legislation into national law. A second key driver is to aim for energy security through the diversification of energy sources and suppliers and the promotion of domestic energy sources. Nevertheless, these policies have an effect on GHG emissions. The review team noted a low budget and very limited administrative capacity for monitoring, evaluation and reporting on climate policy, research and administration.

135. As an EU member State, Greece intends to participate in the EU-ETS. In December 2004, the MEPPPW published a draft NAP for CO_2 emission allowances under the EU-ETS for the period 2005-2007, which was approved by the European Commission in June 2005. The NAP covers installations mainly in the sectors of electricity generation, cement production and refineries. Of the 74.43 million allowances allocated per year as an average of the period 2005-2007, 96 per cent were granted free of charge to 141 existing installations, while the remaining 4 per cent were reserved for 27 known and for unknown new entrants.

136. Further success stories include the introduction of natural gas into Greece's energy system, the promotion of RES (particularly wind power and solar heating), good cooperation with the industry sector (PPC and other energy industry players), and a high level of coherence in the NC3.

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