Advance Version

COMPLIANCE COMMITTEE

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Report of the in-depth review of the fifth national communication of Greece

Note by the secretariat

The report of the in-depth review of the fifth national communication of Greece was published on 26 May 2011. For purposes of rule 10, paragraph 2, of the rules of procedure of the Compliance Committee (annex to decision 4/CMP.2, as amended by decision 4/CMP.4), the report is considered received by the secretariat on the same date. This report, FCCC/IDR.5/GRC, contained in the annex to this note, is being forwarded to the Compliance Committee in accordance with section VI, paragraph 3, of the annex to decision 27/CMP.1.

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Framework Convention on Climate Change

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Report of the in-depth review of the fifth national communication of Greece

Parties included in Annex I to the Convention are requested, in accordance with decision 10/CP.13, to submit a fifth national communication to the secretariat by 1 January 2010. In accordance with decision 8/CMP.3, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol shall include in their fifth national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. In accordance with decision 15/CMP.1, these Parties shall start reporting the information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention for the first year of the commitment period. This includes supplementary information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. This report presents the results of the in-depth review of the fifth national communication of Greece conducted by an expert review team in accordance with the relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

Contents

I. Introduction and summary

A. Introduction

1. For Greece the Convention entered into force on 2 November 1994 and the Kyoto Protocol on 16 February 2005. Within the burden-sharing agreement of the European Union (EU) for meeting commitments under the Kyoto Protocol, Greece committed itself to limiting the growth in its greenhouse gas (GHG) emissions to 25 per cent in relation to the base year[1] level during the first commitment period from 2008 to 2012.

2. This report covers the in-country in-depth review (IDR) of the fifth national communication (NC5) of Greece, coordinated by the UNFCCC secretariat, in accordance with the guidelines for review under Article 8 of the Kyoto Protocol (decision 22/CMP.1). The review took place from 31 January to 5 February 2011 in Athens, Greece, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Gonçalo Cavalheiro (Portugal), Ms. Tatyana Ososkova (Uzbekistan), Mr. Dennis Rudov (Belarus) and Mr. Christoph Streissler (Austria). Ms. Ososkova and Mr. Streissler were the lead reviewers. The review was coordinated by Ms. Inkar Kadyrzhanova (UNFCCC secretariat).

3. During the IDR, the expert review team (ERT) examined each section of the NC5. The ERT also evaluated the supplementary information provided by Greece as a part of the NC5 in accordance with Article 7, paragraph 2, of the Kyoto Protocol. In addition, the ERT reviewed the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, which was provided by Greece in its 2010 annual submission under Article 7, paragraph 1, of the Kyoto Protocol.

4. In accordance with decision 22/CMP.1, a draft version of this report was communicated to the Government of Greece, which provided comments that were considered and incorporated, as appropriate, in this final version of the report.

B. Summary

5. The ERT noted that Greece's NC5 mostly complies with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications" (hereinafter referred to as the UNFCCC reporting guidelines). As required by decision 15/CMP.1, supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol[2] is provided in the NC5. Greece considered all key recommendations provided in the Report on the IDR of the fourth national communication (NC4) of Greece[3], for example: reporting of all supplementary information under Article 7, paragraph 2, of the Kyoto Protocol; reporting of the total effect of implemented and adopted policies and measures (PaMs); and emissions projections relating to fuel sold for use in ships and aircraft engaged in international transport. The ERT commends Greece for the improvements in the completeness of its reporting.

[1] "Base year" refers to the base year under the Kyoto Protocol, which is 1990 for carbon dioxide, methane and nitrous oxide, and 1995 for perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6). The base year emissions include emissions from sectors/source categories listed in Annex A to the Kyoto Protocol.

[2] Decision 15/CMP.1, annex, chapter II.

[3] FCCC/IDR.4/GRC.

6. The supplementary information on the minimization of adverse impacts referred to in paragraph 3, above, is complete and transparent and was provided on time.

1. Completeness

7. The NC5 covers all sections required by the UNFCCC reporting guidelines, and all the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. Although almost all of the mandatory reporting elements are presented in the NC5, the ERT notes that the completeness of the reported information could be further improved by providing, for example, information on the PaMs subdivided by GHG and a summary table on PaMs for each sector (see para. 25 below). During the review, Greece provided the information on the missing reporting elements. The ERT recommends that Greece enhance the completeness of its reporting by providing this information in its next national communication.

2. Transparency

8. The ERT acknowledged that Greece's NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, is broadly transparent and well-structured. The NC5 provides clear information on all aspects of the implementation of the Convention and its Kyoto Protocol. The NC5 is structured following the outline contained in the annex to the UNFCCC reporting guidelines, and supplementary information submitted under Article 7, paragraph 2, of the Kyoto Protocol is easily identifiable. During the review, the ERT formulated a number of recommendations that could help Greece to further increase the transparency of its reporting with regard to the projections (see para. 73 below) and financial resources and technology transfer (see para. 109 below).

3. Timeliness

9. The NC5 was submitted on 18 January 2010, after the deadline of 1 January 2010 mandated by decision 10/CP.13. Greece did not inform the secretariat about difficulties with the timeliness of its NC5 submission in accordance with paragraph 139 of decision 22/CMP.1. The ERT recommends that Greece improve the timeliness of its reporting and submit its next national communication in a timely manner.

II. Technical assessment of the reviewed elements

A. National circumstances relevant to greenhouse gas emissions and removals, including legislative arrangements and administrative procedures

10. In its NC5, Greece has provided a concise description of the national circumstances, elaborated on the framework legislation and key policy documents on climate change. The NC5 also included the description of a national system provided in the national inventory report (NIR) of the 2010 annual submission. Further technical assessment of the institutional and legislative arrangements for coordination and implementation of PaMs is provided in section II.B.I of this report.

1. National circumstances

11. In its NC5, Greece has provided a description of its national circumstances, and information on how some of these national circumstances affect GHG emissions and

removals in Greece and how changes in national circumstances affect GHG emissions and removals over time. Information was provided on the government structure, population, geography, climate, economy and relevant economic sectors. The ERT notes that the main drivers of the emission trends in Greece include strong economic growth, increased population, improvements in living standards, increased vehicle fleet and road transportation activities, and continued reliance on fossil fuels for primary energy supply. However, the ERT notes that a description of the driving factors behind the emission and removal trends in the LULUCF sector has not been provided in the appropriate section of the NC5. Taking into account that the missing information is presented in the NIRs of the 2009 and 2010 annual submissions, the ERT recommends that Greece include this information in its next national communication. Table 1 illustrates the national circumstances of the country by providing some indicators relevant to GHG emissions and removals.

12. Greece is a parliamentary democratic republic, which is headed by the President, who is elected every five years by the Parliament. The overall responsibility for climate change policy-making lies with the Ministry of Environment, Energy and Climate Change (MEECC) of Greece, which is also responsible for energy policy, forest management, environmental protection and physical and town planning. Until the reorganisation in 2009, the Ministry for the Environment, Physical Planning and Public Works (MEPPPW) was responsible for climate change policies. Other ministries are involved in the implementation of climate change policy within their field of competencies and responsibility. Final approval of all climate change policies is made by the Council of Ministers. Some PaMs are implemented by the local governments in areas of their competencies (see para. 34 below). The ERT notes that the climate change policy is mostly identified and implemented at the national level. Further legislative arrangements and administrative procedures, including those for the national system and the national registry are presented in sections II.A.2, II.A.3 and II.B of this report.

Table 1
Indicators relevant to greenhouse gas emissions and removals for Greece

	1990	*1995*	*2000*	*2005*	*2008*	*Change 1990–2000 (%)*	*Change 2000–2008 (%)*	*Change 1990–2008 (%)*
Population (million)	10.34	10.63	10.92	11.10	11.24	5.6	2.9	8.7
GDP (2000 USD billion using PPP)	159.48	169.67	201.02	245.53	273.51	26.0	36.1	71.5
TPES (Mtoe)	21.45	22.67	27.09	30.24	30.43	26.3	12.3	41.9
GDP per capita (2000 USD thousand using PPP)	15.42	15.96	18.41	22.12	24.33	19.4	32.2	57.8
TPES per capita (toe)	2.07	2.13	2.48	2.72	2.71	19.6	9.1	30.5
GHG emissions without LULUCF (Tg CO_2 eq)	104.43	109.02	126.25	134.31	128.52	20.9	1.8	23.1
GHG emissions with LULUCF (Tg CO_2 eq)	101.95	105.84	123.21	131.16	125.34	20.9	1.7	22.9
CO_2 emissions per capita (Mg)	8.05	8.16	9.45	10.21	9.79	17.3	3.6	21.6

	1990	*1995*	*2000*	*2005*	*2008*	*Change 1990–2000 (%)*	*Change 2000–2008 (%)*	*Change 1990–2008 (%)*
CO_2 emissions per GDP unit (kg per 2000 USD using PPP)	0.52	0.51	0.51	0.46	0.40	–1.7	–21.6	–22.9
GHG emissions per capita (Mg CO_2 eq)	10.10	10.26	11.56	12.10	11.43	14.5	–1.1	13.2
GHG emissions per GDP unit (kg CO_2 eq per 2000 USD using PPP)	0.65	0.64	0.63	0.55	0.47	–4.1	–25.2	–28.2

Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, PPP = purchasing power parity, TPES = total primary energy supply.

Data sources: (1) GHG emissions data: Greece's 2010 GHG inventory submission; (2) Population, GDP and TPES data: International Energy Agency.

Note: The ratios per capita and per GDP unit are calculated relative to GHG emissions without LULUCF; the ratios are calculated using the exact (not rounded) values and may therefore differ from a ratio calculated with the rounded numbers provided in the table.

13. In its NC5, Greece has provided a summary of information on GHG emission trends for the period 1990–2007. This information is consistent with the 2009 national GHG inventory submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent (CO_2 eq) (given in the common reporting format (CRF)), are provided in an annex to the NC5. During the review, the ERT assessed the submitted 2010 annual submission and reflected the findings in this report.

14. Total GHG emissions excluding emissions and removals from LULUCF increased by 23.1 per cent between 1990 and 2008, whereas total GHG emissions including LULUCF increased by 22.9 per cent. This growth was mainly attributed to CO_2 emissions, which increased by 32.2 per cent over this period. Emissions of methane (CH_4) decreased by 10.0 per cent, and emissions of nitrous oxide (N_2O) decreased by 30.4 per cent. A major part of the total emission increase was experienced during the period 1995–2004 and emissions level remained broadly stable in the years 2005–2007. The total emissions decreased in 2008 compared with 2007 by 3.6 per cent, which resulted from decrease in CO_2 emissions by 3.8 per cent, CH_4 emissions by 0.9 per cent, and N_2O by 9.9 per cent. Emissions of fluorinated gases (F-gases) accounted for 1.2 per cent of total GHG emissions in 1990 and 2.0 per cent in 2008. The trends in total GHG emissions were mostly underpinned by GHG emissions trends in the energy sector (81.0 per cent in total emissions in 2008) and the agriculture sector (6.9 per cent in total emissions in 2008), driven by the above-mentioned emission drivers (see para. 11 above). Analysis of the drivers for GHG emissions trends in each sector is provided in section II.B of this report. Table 2 provides an overview of GHG emissions by sector from the base year to 2008.

Table 2
Greenhouse gas emissions by sector in Greece, 1990–2008

	GHG emissions (Tg CO2 eq)						*Change (%)*		*Shares[a] by sector (%)*	
Sector	*1990*	*1995*	*2000*	*2005*	*2007*	*2008*	*1990–2008*	*2007–2008*	*1990*	*2008*
1. Energy	77.40	80.85	97.14	106.71	108.01	104.16	34.6	–3.6	74.1	81.0
A1. Energy industries	43.16	44.94	54.83	58.19	59.46	57.82	34.0	–2.8	41.3	45.0
A2. Manufacturing industries and construction	9.62	9.27	9.78	10.23	10.16	9.30	5.6	–8.4	9.2	7.2
A3. Transport	14.77	16.85	19.56	22.10	23.74	22.69	53.6	–4.4	14.1	17.7
A4.–A5. Other	8.59	8.47	11.46	14.57	13.08	12.80	48.9	–2.2	8.2	10.0
B. Fugitive emissions	1.26	1.31	1.51	1.62	1.57	1.55	23.1	–1.3	1.2	1.2
2. Industrial processes	10.17	12.27	13.81	13.79	11.52	11.24	10.6	–2.4	9.7	8.7
3. Solvent and other product use	0.31	0.30	0.31	0.31	0.31	0.31	1.9	0.2	0.3	0.2
4. Agriculture	11.35	10.33	9.99	9.44	9.58	8.92	–21.4	–6.9	10.9	6.9
5. LULUCF	–2.48	–3.18	–3.03	–3.15	–3.03	–3.18	28.2	4.9	–2.4	–2.5
6. Waste	5.21	5.27	5.01	4.05	3.94	3.89	–25.4	–1.4	5.0	3.0
7. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GHG total with LULUCF	101.95	105.84	123.21	131.16	130.33	125.34	22.9	–3.8	NA	NA
GHG total without LULUCF	104.43	109.02	126.25	134.31	133.36	128.52	23.1	–3.6	100.0	100.0

Abbreviations: NA= not applicable, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

Data source: GHG emissions data: Greece's 2010 GHG inventory submission.

Note: The changes in emissions and the shares by sector are calculated using the exact (not rounded) values and may therefore differ from values calculated with the rounded numbers provided in the table.

[a] The shares of sectors are calculated relative to GHG emissions without LULUCF; for the LULUCF sector, the negative values indicate the share of GHG emissions that was offset by GHG removals through LULUCF.

15. The ERT notes that the explanation of the driving factors behind the emission trends in the energy sector has been broadly the same as in the appropriate chapter of the NC4, and that updated information on emissions for the latest years of the time series and percentage ratios has been reported in the NC5. According to the information received during the review, the driving factors behind the emission trends have not been changed since the publication of the NC4. The ERT reiterates the recommendation of the annual review report on the 2009 annual submission[4] (2009 ARR) that Greece provide in its next

[4] FCCC/ARR/2009/GRC.

national communication the additional information on the driving factors of the emission trends from the waste sector.

2. National system

16. In accordance with decision 15/CMP.1, Greece provided in its NC5 a description of how its national system is performing the general and specific functions defined in the guidelines for national systems under Article 5, paragraph 1 (decision 19/CMP.1). The Party also provided a reference to the 2009 annual submission, which contains a more detailed description of the national system. The description includes all the elements as required in decision 15/CMP.1.

17. Greece provided a description of national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol, also contribute to the conservation of biodiversity and sustainable use of natural resources. The MEECC approved a circular that sets a general legal framework defining roles and responsibilities of the national organizations involved in the national system. The School of Chemical Engineering of the National Technical University of Athens (NTUA) has the technical and scientific responsibility for the compilation of the inventories, while various ministries and agencies have the responsibility of ensuring the provision of data.

18. During the review, Greece provided updated information on the national system, elaborating on the capacity of the national system, changes in the institutional and legislative arrangements since the NC5 submission and on administrative procedures for GHG inventory planning, preparation and management.

19. The ERT took note of the recommendations of the 2009 ARR. During the review, the ERT learned that the Party had made some efforts to implement some of the recommendations from the 2009 ARR, such as, reporting the activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, and improving the key category and uncertainties analyses and the completeness of its reporting in general. The ERT concluded that the national system continued to perform its required functions as set out in decision 19/CMP.1.

3. National registry

20. In its NC5, Greece has provided information on the national registry, including a description on how its national registry performs the functions defined in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and how it complies with the requirements of the technical standard for data exchange between registry systems. The description of the national registry contains all the mandatory elements as per paragraph 32(a)–(j) of the annex to decision 15/CMP.1 .

21. According to the MEECC decision, the National Centre for the Environment and Sustainable Development operates the Greek national registry, which is hosted and supported by SmartTech, located in Vienna, Austria. During the review, the ERT learned that the national registry experienced serious security violation problems in January 2011. The Party informed the ERT about the additional security measures put in place after the security violation, which included temporarily overtaking internal and external transactions by the registry administrator and commissioning the identification and implementation of higher level security measures. During the review, Greece provided additional information on the security measures employed by the national registry to prevent unauthorized manipulations, such as the use of a hardware device (smart card) that contains an encrypted key to access the administrator or user account as well as the measures put in place to protect the registry against security compromises, such as contracting a designated

company to test the unauthorised intrusion attacks and identify weaknesses in the registry software protection. In response to the questions raised by the ERT, Greece provided documents demonstrating how it records the changes related to the national registry and how it maintains these records. The ERT notes that the updates of databases and applications, the implemented security measures and the changes to the national registry software are documented on a regular basis by nominated responsible staff. The ERT recommends that the Party strengthen the implementation of the security measures in place to prevent and resolve unauthorized manipulations according to paragraph 115(e) of the annex to decision 22/CMP.1.

22. The ERT took note of the conclusion of the standard independent assessment report (SIAR) that the national registry of Greece continues to perform its required functions and continues to adhere to the technical standards for data exchange between registry systems, and of the recommendation that the Party further improve access to the public information referred to in paragraphs 45–48 of the annex to decision 13/CMP.1 by providing this information in English and to report on the changes in the next annual submission. During the review, Greece assured the ERT that it will address these recommendations and present this information in its next national communication.

23. The ERT concluded that Greece's national registry continues to perform the functions set out in the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with decisions 16/CP.10 and 12/CMP.1.

B. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol

24. As required by the UNFCCC reporting guidelines, Greece has provided in its NC5 comprehensive, concise and well-organized information on its package of PaMs implemented and adopted, and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol. Each sector has its own textual description of the principal PaMs, supplemented by a summary table on PaMs for all sectors. Greece has also provided limited information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objectives of the Convention. The NC5 contains a similar set of PaMs to those in the NC4.

25. However, the ERT noted that in its NC5, Greece has not presented the information on PaMs by sector, subdivided by GHG, supplemented by a summary table for each sector on PaMs identified to implement commitments under Article 4, paragraph 2(a) and (b), of the Convention. During the review, additional information was provided by the Party to enhance the completeness and transparency of its reporting. The ERT recommends that, in its next national communication, Greece adhere more closely to the UNFCCC reporting requirements and provide complete information on each PaM together with a textual description and a summary table by sector and by affected gas.

26. In its NC5, Greece addressed most of the recommendations of the previous review report, but some recommendations still remain to be addressed, such as, for example, on the presentation of a structured set of PaMs, which address the existing barriers to further emissions reduction, particularly in the transport sector, which could significantly affect the emission trends.

27. In its NC5, Greece has reported on the strategy for sustainable development and the second national climate change programme which were launched in 2002 to define the climate change policy framework, set the climate change mitigation as one of the sustainable development priorities and identify the additional measures needed to meet the

Kyoto Protocol target. These policies have been referred to by Greece as the cornerstones of its climate change policy. Until recently, the Greek climate change policy has been focused on meeting its Kyoto Protocol target, while currently the efforts are already geared towards taking the country on a path to achieve the 2020 targets (see para. 36 below).

28. In its NC5, Greece has reported that the PaM with the greatest impact on GHG emissions reduction is the use of natural gas. The EU emissions trading scheme (EU ETS) has been reported as a key cross-cutting measure.

29. In its NC5, Greece has reported that the estimate of the total effect of PaMs takes into account the policy overlaps and synergies, but has not provided further details on quantification of the effects of synergies or on whether these synergies are positive or negative. In its NC5, Greece has reported the aggregate estimated emission reduction effect of PaMs at the sectoral level. These estimates have been reported separately for implemented and adopted PaMs and for planned PaMs. During the review, Greece provided the ERT with the updated information on the estimated effect of implemented and adopted PaMs as well as planned PaMs. The ERT encourages the Party to report in its next national communication the methods used to estimate the emission reduction potentials of individual PaMs or collections of PaMs, non-GHG mitigation benefits and how PaMs interact and complement other PaMs at the national level.

30. During the review, the ERT requested Greece to present the current and future arrangements for monitoring and evaluating the implementation of the PaMs, in order to allow for an early identification of any deviations from the planned path and to allow for the identification of corrective action. Greece informed the ERT that there were no such formal arrangements for monitoring in place. The ERT notes with satisfaction that the Party was able to collect and provide the latest information on the implementation status and mitigation effect of each PaM until the end of 2010 in a very short time. This suggests that putting in place the arrangements for PaMs monitoring and evaluation, including defining roles, responsibilities and procedures, may require a little additional effort by the Party. The ERT encourages Greece to make such effort and report in its next national communication a description of the way in which the progress of PaMs is monitored and evaluated over time.

31. In its NC5, Greece has provided information on the costs of PaMs, with the actual costs incurred in the period 1994–2006 and projected costs for the period 2007–2013 (EUR 25.5 billion for the projected costs only). The sources of funding reported are the national budget and EU funds from the community support framework. The ERT commends Greece for its effort in providing information on funding of PaMs and encourages the Party to present more detailed information on the costs of individual PaM in its next national communication.

32. Greece has provided detailed information on the fiscal policies, including subsidies and tax exemptions, and their impact on GHG emissions. However, no quantification of such effects has been provided. During the review, Greece informed the ERT that such estimates are not available and highlighted that for most of the fiscal measures the GHG emission reduction has not been a primary objective. The ERT notes that some fiscal measures, such as tax exemptions on some fossil fuels, may lead to an emissions increase. Most of the fiscal measures reported could be allocated, in terms of reporting, to a given sector where the impact on emissions would be observed. The ERT encourages Greece to consider estimating the potential emission reductions or increases of key fiscal measures and report this information in the respective activity sector in its next national communication.

33. In its NC5, the Party reported that there are no PaMs reported in the NC4 which are no longer in place. During the review, however, Greece stated that the same PaMs reported

in the NC4 have evolved over time and have been adjusted both in terms of goals and instruments. The ERT encourages Greece to include in its next national communication the information which facilitates the tracking of the evolution of the PaMs, their alterations and the effects achieved. The ERT recommends that Greece report in more detail in its next national communication on how it believes its PaMs modify longer-term trends. The ERT notes that the NC5 does not identify the policies and practices which encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur. The ERT encourages Greece to consider identifying and reporting such policies and practices in its next national communication to improve the completeness of its reporting.

34. Almost all reported measures are implemented at the national level. According to the NC5, the main competences of the local governments relating to climate change include, among others: traffic and public transportation studies; mainstreaming of RES in the regional development plans; and the promotion of RES use in the public buildings and for wastewater treatment. The ERT encourages Greece to include relevant information on the efforts made by local governments in climate change policy implementation in its next national communication. Table 3 provides a summary of the reported information on the PaMs of Greece.

Table 3
Summary of information on policies and measures

Major policies and measures	*Examples/comments*
Policy framework and cross-sectoral measures	
General policy	2nd National Climate Change Programme (2002) Plan for achieving the EU 20-20-20 targets (2010) includes three scenarios for key GHG emitting sectors up to 2020
Emissions trading scheme	2nd trading period 2008–2012: 140 installations covered
Fiscal measures	Several fiscal measures with potential (undetermined) impact on the environment, including a CO_2-based road tax applied to vehicles since 2010
Policies and measures by sector	
Energy	
Promotion of natural gas	Measures to facilitate and incentivize the use of natural gas in electricity production and in final energy-use sectors (including transport) (27.5 Mt CO_2 eq)
Conventional power generation	Decommissioning old inefficient lignite power plants and respective replacement by more efficient plants (either lignite- or natural gas-fuelled)
Renewable energy	Use of renewables (in particular, wind and solar) in electricity production (22.4 Mt CO_2 eq); use of renewables in heat supply
Energy efficiency	The National Energy Efficiency Action Plan includes measures aimed at energy saving of 9 per cent of the average final energy consumption for the period 2001–2005 by 2016 in residential, tertiary, industry (outside the EU ETS) and transport (6.7 Mt CO_2 eq)

Transport	
	Introduction of biofuels (1.8 Mt CO_2 eq); Measures to further promote less carbon-intensive public transportation systems, such as metro and train lines (0.3 Mt CO_2 eq)
Industrial processes	
	Establishment of a certifiable process for the management of equipment containing F-gases and for the handling of F-gases at the end of the life-cycle of respective equipment
Agriculture	
	Promotion of organic farming (Greek Rural Development Plan) leading to a reduced use of synthetic nitrogen fertilizers and introduction of wet systems for manure management (1.9 Mt CO_2 eq)
	EU Common Agricultural Policy: changes in support system to farmers, reduced rates of agricultural land use and reduced inputs of synthetic nitrogen fertilizers
Forestry	
	Sustainable management of forests including afforestation of croplands and non-croplands, conversion of coppices into high forests, and increase, improvement and enrichment of wood stock by introducing new forest species in degraded stands
Waste	
	Separation of biodegradable waste from waste directed to landfills and composting
	Closing of unmanaged solid waste sites, biogas flaring and energy recovery
	National plan on sewage sludge management is under preparation, which aims at seizing the energy potential of biogas recovered from anaerobic wastewater treatment systems

Note: The GHG reduction estimates, given for some measures (in parentheses), are reductions in Mt CO_2 eq for the year 2020, as provided by Greece during the review.

1. Policy framework and cross-sectoral measures

35. The MEECC (and the MEPPPW until 2009) is the main governmental body entrusted with the development and implementation of environmental and climate change policy in Greece and with the coordination of these activities with the relevant sectoral ministries. Climate change policy, particularly relating to mitigation, is discussed at the inter-ministerial committee, which prepares measures for official adoption by the Council of Ministers. In its NC5, Greece has provided a brief description of the roles of each ministry in the environmental and climate change policy framework.

36. The second national climate change programme adopted in 2002 is a cornerstone of the Greek climate change policy and has been prepared in order to outline the national path to achieving the Kyoto Protocol target for the first commitment period (2008–2012). Greece adopted the national energy efficiency action plan (NEEAP) (2008), the national renewable energy action plan (NREAP) (2010), and the plan to achieve the EU's "20-20-20

targets" (2010). The NEEAP and the NREAP have been prepared following the adoption of the EU climate and energy package and were further supported by the national "Plan for the Achievement of the 20-20-20 targets". The plan addresses three ambitious targets set by the EU for the year 2020: 20 per cent reduction of GHG emissions; 20 per cent increase in energy efficiency; and meeting 20 per cent of energy needs from RES. In addition, the plan outlines the development path for Greece in the event that the EU sets a 30 per cent emission reduction target when other industrialized countries commit themselves to comparable efforts.

37. Greece has reported on a number of European Common and Coordinated Polices and Measures (CCPMs), which constitute a substantial part of the Party's climate change policy. The CCPMs cover such sectors as energy supply and consumption, waste, transport, industrial processes and agriculture.

38. Greece has reported on the effect of the EU ETS. During phase I of the EU ETS (2005–2007), according to the first national allocation plan (NAP), 139 installations were covered by the scheme and 213.5 million allowances were allocated, while a new entrant reserve was 9.7 million allowances. The total allowances surrendered were 213.9 million. In phase II (2008–2012), according to the second NAP, 140 installations are covered by the scheme, 315.4 million allowances were allocated, while 26.1 million allowances were reserved for new entrants. It is projected that, overall, a deficit of 5–10 million allowances will be observed by the operators, including a deficit of 20–25 million and 2–3 million allowances in the energy and oil refinery sectors, respectively, and a surplus of about 17 million allowances in the remaining sectors. The installations covered by the EU ETS are expected to reduce their collective emissions by 69.2 Mt CO_2 eq during phase II. The non-ETS sectors have a target of 4 per cent reduction in emissions compared with emission levels in 2005.

2. Policies and measures in the energy sector

39. Between 1990 and 2008, GHG emissions from the energy sector increased by 34.6 per cent and the energy sector's share in the total GHG emissions (without LULUCF) increased from 74.1 per cent to 81.0 per cent. This trend was driven mainly by improvements in living standards, increased vehicle fleet and road transportation activities. The trend in GHG emissions from fuel combustion showed notable increases in transport (53.6 per cent) and in energy industries (34.0 per cent). Between 1990 and 2007, the numbers of registered passenger cars increased by about 2.5 times. In the residential and services sectors, the increased use of solar energy did not keep pace with the growing number of dwellings, improved standards of living and increasing floor area of commercial premises.

40. ***Energy supply.*** The consumption of oil and coal products has retained a high share during the period 1990–2007, with the only significant change being attributable to the introduction, in 1997, of natural gas in the Greek energy system, which accounted for 11 per cent of gross inland consumption in 2007. Lignite is reported to be the only significant domestic fossil energy source, accounting for 55 per cent of electricity production and 26 per cent of energy consumption. Greece has reported measures aimed at increasing efficiency of the traditional power generation system, namely by decommissioning old lignite power plants and replacing them with more efficient ones (fired either by lignite or natural gas).

41. The use of natural gas in the Greek energy system is a major priority of the national energy policy and is the most effective policy, as measured by the estimated emission reduction potential. During the review, Greece reported the updated emission reduction potentials such as: for natural gas use in electricity generation as 11.2 Mt CO_2 eq in 2010 and 26.1 Mt CO_2 eq in 2020, and for natural gas use in industry as 0.4 Mt CO_2 eq in 2010

and 0.6 Mt CO_2 eq in 2020. Greece reported that the progress in the implementation of these PaMs was considered satisfactory. However, the ERT notes that according to the updated information the expected emission reduction potentials have not been reached in 2010. For example, in the NC5 the emission reduction potential of the natural gas use in electricity generation system was estimated as 14.1 Mt CO_2 eq, and of the natural gas use in industry as 0.7 Mt CO_2 eq in 2010; these numbers are lower than those reported by the Party during the review.

42. At the same time, there were cases where the emission reduction potential was exceeded. For example, Greece reported in the NC5 that the progress in promotion of natural gas use in the residential and services sectors was lagging behind and the estimated effect reported in the NC5 for 2010 was 0.2 Mt CO_2 eq, whereas the actual emission reduction achieved was 0.3 Mt CO_2 eq according to the information provided to the ERT.

43. ***Renewable energy sources***. The target of 20 per cent for the share of renewable energy in the gross final energy consumption by 2020 will be achieved through a combination of measures aimed at enhanced use of RES in electricity generation, heating supply and transport. During the review, Greece informed the ERT that to achieve this target, the overall investment needs in the renewable energy sector are estimated at EUR 16.5 billion for the period 2010–2020. The target is split into specific targets by sector and by RES type. By sector, the targets set for RES encompass: 40 per cent of total electricity; 20 per cent of energy for heating; and 10 per cent in biofuels in the road transport sector.

44. The NREAP includes specific targets for wind energy and photovoltaics, which can be compared with actual data that reflect the results from the implementation of related measures. For wind energy, the NREAP sets a target of installed capacity of 1.33 GW by 2010. Data provided to the ERT during the review show that this target has been achieved.

45. For photovoltaic units, the NC5 suggests that Greece experienced significant delays in meeting its national targets, but it has already taken some corrective action to speed up the policy implementation. The complexity of the licensing process has been identified as a main barrier to the introduction of photovoltaic units. With the adoption of the law regulating the licensing of construction and operation of RES systems in 2006, the licensing procedures have been simplified through the establishment of a 'one stop shop' centre for solar energy operators (this also applies to other RES). The removal of this barrier resulted in the 'boom' in photovoltaics use and the upward trend in registered generation capacity from 0.0013 GW in 2008 to 0.19 GW in 2010.

46. ***Energy efficiency***. The NEEAP, pursuant to the EU directive on energy end-use efficiency and energy services, sets an energy savings target of 9 per cent of average annual final energy consumption over the period 2001–2005 to be reached by 2016, which will result in a saving of 16.46 TWh, with an intermediate target of saving 5.1 TWh by 2010. It should be noted that energy consumption by installations covered by the EU ETS, aviation and maritime bunkers and the army forces are excluded from this target. In accordance with the energy savings scenario included in the Party's action plan, the greatest saving potential lies within the transport sector, which accounts for 36 per cent of total potential savings, followed by the services sector and the residential sector at 30 per cent and 29 per cent, respectively.

47. Some of the measures included in the NEEAP include: energy performance of buildings, energy labelling of appliances and minimum energy efficiency requirements, energy upgrading of existing buildings through third-party financing arrangements, energy performance contracting and public and private sector synergies, promotion of cogeneration of heat and power and district heating systems. The ERT notes that in the NC5 the description of the energy efficiency PaMs is rather brief. The ERT encourages Greece to

report more detailed information on its energy efficiency PaMs in order to increase the transparency of its reporting.

48. ***Residential and commercial sectors.*** Energy efficiency measures and use of natural gas and of RES make up the major part of the potential emission reductions in the residential and commercial sectors. Several energy efficiency PaMs reported in the NC5 have been included in the NEEAP. In its NC5, Greece has highlighted an initiative, co-financed by the EU funds, which provided financing of 35 per cent of initial costs as a subsidy, for the replacement of inefficient air-conditioning units and resulted in the estimated emission reduction of 0.05 Mt CO_2 eq in 2010.

49. During the review, Greece presented details of several additional measures aimed at reducing emissions in the residential and commercial sectors, namely energy auditing and labelling of buildings, energy upgrading of social housing and the compulsory installation of central solar thermal systems in tertiary-sector buildings larger than 1,000 m^2.

50. ***Transport sector***. Between 1990 and 2008, GHG emissions from transport increased by 53.6 per cent. Greece has recognized that, as the transport sector has experienced high emission growth rates, the implementation of mitigation measures in this sector is crucial. The use of biofuels in the road transportation sector and of natural gas in the public sector are highlighted as the key measures in the transport sector. Other PaMs have been described in the previous NCs and therefore there is only a brief description of these in the NC5, which is in accordance with the UNFCCC reporting guidelines.

51. Greece has reported progress in the implementation of PaMs that promote the use of less carbon-intensive transport modes, such as the construction of subway and train lines in several cities and regions of the country. The ERT noted during the review that Greece has not estimated the impact of road construction in this sector, which is expected to lead to increased emissions. The ERT recommends that Greece identify and quantify the impact of PaMs, which may increase the GHG emissions in the transport sector, such as road construction. The ERT notes that Greece has not addressed through the PaMs the problems of steeply increasing number of cars and corresponding emission trends in this sector. The ERT also notes an observation by the previous ERT that even though transport-related measures were in place, sectoral emissions have continued to rise considerably.

52. The emission reduction potential of the PaMs in the transport sector has been reported in the NC5 as 'not estimated'. However, the ERT notes that during the review, the Party provided estimates of the emission reduction impacts of the PaMs in the transport sector in 2020, and these amount to 1.8 Mt CO_2 eq for the introduction of biofuels and 0.3 Mt CO_2 eq for the remaining measures in this sector. The ERT encourages Greece to make an additional effort to identify and address the barriers to implementation of the measures in this sector and to quantify the emission reduction potential of such measures in its next national communication.

53. During the review, Greece reported that it participates in the work of the International Civil Aviation Organisation and the International Maritime Organisation (IMO) aimed at limiting or reducing the emissions from international aviation and maritime navigation. With regard to international maritime navigation, Greece informed the ERT about the EU position on the commitments to reduce the emissions from international maritime navigation. According to the EU, if the international agreement on reduction of emissions from marine bunker fuels is not reached through the IMO or UNFCCC negotiation process by 31 December 2011, then the EU will make a proposal to include the reduction of emissions from marine bunker fuels into the EU emission reduction commitments, with the aim to making this proposal enter into force by 2013.

54. ***Industrial sector.*** Most of the reported PaMs for the industrial sector are directly or indirectly related to the EU ETS and/or the NEEAP, such as the promotion of the natural

gas use in the industrial sector. The measures in the industrial sector that are included into the NEEAP are estimated to reduce emissions by 1.0 Mt CO_2 eq in 2020, in addition to this, the promotion of natural gas will reduce emissions by 0.8 Mt CO_2 eq in 2020.

3. Policies and measures in other sectors

55. Between 1990 and 2008, the trend in GHG emissions from the industrial processes sector showed a notable increase (10.6 per cent), which was partly compensated for by the decrease in emissions from the agriculture sector (21.4 per cent) and from the waste sector (25.4 per cent).

56. ***Industrial processes***. In its NC5, Greece has reported limited information on the PaMs in the industrial processes sector; and the ERT notes that the provided information was insufficient to allow for an in-depth understanding of the PaMs and their impacts on emission. Greece reported that the only plant producing HCFC-22 ceased operation in 2005.

57. With regard to the emissions of F-gases, during the review Greece informed the ERT about the preparation of legislation covering the introduction and implementation of all necessary measures for the proper management of F-gases and the minimization of leakages and relevant emissions from equipment and installations, following the requirements of EU regulations on certain fluorinated GHGs.

58. The ERT notes that Greece has failed to address the encouragement of the previous ERT to report on any efforts to reduce emissions from cement production. However, during the review, the Party informed the ERT that there is a programme to increase the amount of pozzolan or fly ash in final cement and thereby to reduce the amount of clinker needed. This contributes to a decrease in CO_2 emissions from the cement production process. The ERT encourages Greece to strive to further identify and report the PaMs and their impact on emission reductions from the industrial processes sector.

59. ***Agriculture***. Between 1990 and 2008, GHG emissions from the agriculture sector decreased by 21.4 per cent, and the sector's share of the total GHG emissions decreased from 10.9 per cent to 6.9 per cent. The PaMs reported for the agriculture sector are limited to the reduction of N_2O emissions by reduced fertilizer application (in particular, in organic farming) and by the introduction of wet systems for manure management.

60. In addition, Greece reported on the policy of disengagement of support to farmers from agricultural production that has a non-estimated impact on emission reductions due to the reduced agricultural output and reduced use of synthetic nitrogen fertilizers. During the review, Greece informed the ERT that the emission reduction impact of these measures is estimated as 1.6 Mt CO_2 eq in 2010 and 1.9 Mt CO_2 eq in 2020.

61. ***LULUCF***. During the period 1990–2008 net removals increased by 0.7 Tg CO_2 eq, and in 2008 the LULUCF sector accounted for net removals of 2.5 per cent of total GHG emissions (without LULUCF). In Greece, the LULUCF sector was reported as a net sink of 3.2 Tg CO_2 eq in 2008. The trend in emissions and removals was mainly driven by the afforestation and reforestation programmes put in place in the burnt areas and aimed at reforestation of 180 thousand ha. In years with exceptionally large forest fires (e.g. 2000 and 2007) net removals were considerably lower than the average.

62. The measures in the LULUCF sector aim to conserve and restore existing forests, in addition to planting new forests and converting croplands and non-croplands into forest. Total potential CO_2 removal from the implemented and adopted, and planned measures as reported in the NC5 is estimated as 4.0 Mt CO_2 eq. During the review, Greece informed the ERT about its new estimations of the potential removals from the activities under Article 3,

paragraphs 3 and 4, of the Kyoto Protocol that is now estimated as 3.5 Mt CO_2 eq for the period 2008–2012.

63. In its NC5, Greece has reported only limited information on its activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, stating that the current national legal framework ensures that such activities contribute to the conservation of biodiversity and sustainable use of natural resources, as required by the UNFCCC reporting guidelines. However, the ERT notes that Greece has not included information in its NC5 on the Kyoto Protocol LULUCF activities and its intended use of removal units (RMUs) generated from such activities to reach the Kyoto Protocol target during the first commitment period.

64. During the review, Greece provided additional information on the possible future issuance of RMUs. The ERT notes that, due to the forest management cap (1,650 kt CO_2 eq) and the total removal capacity from forest management activities (estimated as 2,045 kt CO_2 eq in 2008 and 1,945 kt CO_2 eq in 2009), the potential emissions from forest fires are not expected to influence the amount of RMUs to be issued as a result of forest management activities. The ERT encourages Greece to provide additional quantitative information on the mandatory activities under Article 3, paragraph 3, of the Kyoto Protocol, and elected activities under Article 3, paragraph 4, of the Kyoto Protocol, i.e. forest management, namely on the possible issuance of RMUs and their respective possible contribution to the fulfilment of commitments.

65. ***Waste management***. Between 1990 and 2008, the waste sector showed the largest decrease in emissions (25.4 per cent) and a decrease in its share of total GHG emissions (without LULUCF) from 5.0 per cent to 3.0 per cent. This downward trend of emissions has been driven by the growth in waste recycling, increase in biogas collection and flaring and increased coverage of the population by anaerobic waste treatment systems.

66. During the review, Greece reported on the national strategy for municipal waste, which aims to gradually reduce the amount of biodegradable municipal waste disposed of in landfill sites. This PaM sets the interim objectives to achieve the diversion of 25 per cent of municipal waste away from landfill in 2010, 50 per cent in 2013 and 75 per cent in 2020, as compared to 1995. The closure of unmanaged waste disposal sites, gas flaring, use of biogas for energy recovery at landfills and sewage sludge management systems have been identified as the most effective measures in this sector. According to the latest information, the expected emission reduction impacts are 2.0 Mt CO_2 eq in 2010 and 3.7 Mt CO_2 eq in 2020.

67. The NC5 was generally complete; however, the information reported on PaMs was sometimes not transparent enough for the ERT to understand the mechanisms and instruments with which each PaM will deliver emission reductions or to allow for an overall understanding of how PaMs will contribute to long-term mitigation efforts. The updated information provided by the Party during the review increased the transparency of reporting on climate change policy in Greece.

4. Minimization of adverse effects in accordance with Article 2, paragraph 3, of the Kyoto Protocol

68. In its NC5 Greece has reported information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, including the adverse effects of climate change and effects on international trade and social, environmental and economic impacts on other Parties, especially developing country Parties. Further information on how Greece strives to implement its commitments under Article 3, paragraph 1, in such a way as to minimize adverse social, environmental and economic impacts on the developing country Parties, as reported in the 2010 annual submission, is presented in section II. I of this report.

69. The NC5 underlines that Greek climate change policy aims to reduce emissions of all GHGs, thus allowing for the achievement of the well balanced positive effects in all sectors. Greece has also highlighted that key measures in its climate change policy, such as the use of natural gas, have created opportunities for new and enhanced commercial relations and contribute to the promotion of Greek investment in the sustainable development of developing country Parties. In its NC5, Greece has reported that the growing use of RES and the use of natural gas in the sectors of final energy use are leading to the diversification of the energy supply and increased use of local and environmentally friendly energy sources.

C. Projections and the total effect of policies and measures, and supplementarity relating to the Kyoto Protocol mechanisms

70. In its NC5, Greece has provided two emission projection scenarios, 'with measures' and 'with additional measures'. During the review, Greece provided the updated projections prepared in 2011 which show the effects of the economic crisis that Greece is currently experiencing. The projections of GHG emissions were performed by NTUA. In the case of the energy sector these projections were built on the energy system projections performed by the Centre for Renewable Energy Sources and Saving (CRES). Apart from the reporting under the Convention and the Kyoto Protocol, Greece is required to report regularly on the projected emissions under the EU legislation.

1. Projections overview, methodology and key assumptions

71. The GHG emission projections provided by Greece in its NC5 include a 'with measures' scenario (also referred to as 'with existing measures' scenario) and a 'with additional measures' scenario. A 'without measures' scenario has not been reported. Projected emissions are presented for the years 2010, 2015 and 2020 relative to actual inventory data up to 2007. In the NC5, the projections have been presented on a sectoral basis, following the same sectoral categories used in the PaMs section, and on a gas-by-gas basis. The gas-by-gas projections have been performed for the following GHGs: CO_2, CH_4, N_2O, perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF_6) (treating PFCs and HFCs collectively in each case).

72. Projections are also provided in an aggregated format for each sector as well as for a national total, using global warming potential values. The emission projections for the LULUCF sector and for fuel sold to ships and aircraft engaged in international transport (bunker fuels) have been presented separately. The ERT notes that the previous review recommendation, that the Party include in its national communication the emission projections related to fuel sold for use in ships and aircraft engaged in international transport, has been addressed by Greece in its NC5.

73. A definition of the 'with measures' scenario has not been transparently described in the NC5. During the review, Greece provided the ERT with additional information on the reference years since which the effects of the PaMs are included in the 'with measures' scenario. The ERT recommends that Greece present the definition of the 'with measures' scenario more transparently in its next national communication. The difference between the 'with measures' scenario and the 'with additional measures' scenario reflects the effects from the planned PaMs. The projections under the 'with additional measures' scenario were derived by introducing additional assumptions in the energy model. Most of these assumptions stem from the EU climate and energy package (see para. 36 above) and the targets laid down in Greece's NEEAP.

74. The energy sector projections are based on the results of the energy sector models which were also used as a decision basis for the Greek energy policy. The set of models used for the energy sector projections consists of the TIMES/MARKAL model used for modeling the energy market, the WASP IV model specifically used for optimizing the expansion of the power generation system and the COSTPLUS model used to better reflect the effects of RES expansion.

75. The TIMES/MARKAL model, developed within the framework of the Energy Technology Systems Analysis Program of the International Energy Agency (IEA), takes as inputs the energy service demands, primary resource potentials, policy setting and a set of technology options. On this basis, it optimizes energy technology and fuel combination decisions by finding a market equilibrium over a given timeframe. The WASP model, developed by the International Atomic Energy Agency, is dedicated to medium-term analysis of alternative development pathways for the power generation system, working at the level of single (large) power plants. In addition, in order to reflect an increased use of RES in the Greek energy system, the results of the COSTPLUS model are used as a further input into the WASP model. The COSTPLUS model was developed by CRES to simulate the performance of the power system on an hourly basis. During the review, the ERT was informed by Greece that the updates of the energy sector projections are performed on an annual basis and the results are made publicly available. Based on the projected energy consumption, the corresponding GHG emissions are calculated by applying appropriate emission factors.

76. During the review, Greece informed the ERT that is has also used the COPERT model for emission projections for the transport sector, whereas it had been previously used for simulating changes in the vehicle fleet and growth of the transport sector but not for the GHG emissions.

77. In the NC4, the reported energy sector projections were based on a different model, namely ENPEP, a non-linear equilibrium approach to determine the energy supply and demand balance. The ERT notes that in its NC5 Greece has not reported the information on the reasons for this change, and has not described the strengths and weaknesses of the models used for preparing the projections. During the review, Greece informed the ERT that this change was partly due to the reorganization of the Ministries and use of different models by different Ministries. After the reorganisation, the TIMES/MARKAL model was chosen to be a principal model for energy and emission projections. The ERT was also informed that both models are now used in parallel, showing similar results. The ERT encourages Greece to report the main differences between the methods used for the projections in the NC5 and those used in the NC4.

78. According to the NC5, the main assumptions used for the energy sector projections are fuel prices based on IEA estimates, population growth and development of household size based on the census data provided by the National Statistical Service of Greece as well as macroeconomic indicators derived from the model GEM-E3 (a macro-economic general equilibrium model used for EU markets). The macroeconomic indicators include GDP, available income, growth of sectoral production and of transport, etc. In addition, assumptions about future grid interconnection of the islands, a question of particular importance for the Greek energy system, were made. The ERT notes that the assumptions about grid interconnection plans have not been described in the NC5.

79. While an outline of the targets for RES use has been provided, the ERT found that the NC5 has not provided sufficiently clear information on the energy efficiency objectives to be achieved by 2020 and how these objectives were reflected in projections (see para. 46 above). The ERT encourages Greece to provide a clearer presentation of the projected end-use energy savings, at least by sector, and the corresponding assumptions in its next national communication.

80. During the review, Greece presented updated emission projections that took into consideration the updated macroeconomic data showing the decrease in the economic output in the years 2009–2010. Also, the projections took into account the following updated inputs, considerations and information: the most recent IEA fuel price forecasts; a 20 per cent share of RES in final energy consumption; a 40 per cent share of RES in power generation; and a reduced price for the EU ETS allowances of EUR 20/t CO_2 based on estimates from the European Commission. These updated inputs led to the considerably lower projections for 2015 and 2020 than the ones presented in the NC5. The ERT notes that the estimates of the costs of technology development provided by Greece during the review can be regarded as realistic estimates. The assumptions related to economic development were provided by the National Statistical Service of Greece. With regard to the energy sector projections, the ERT concludes that the choice of input parameters was reasonable and that the assumptions were chosen and presented in a transparent way.

81. In the NC5, for the non-energy sectors, no additional PaMs have been considered beyond the implemented and adopted ones. Therefore only a 'with measures' scenario has been reported in the NC5 for the projections from the non-energy sectors. The ERT notes that in its NC5 Greece has followed the previous review recommendation that the Party provide more detailed information on the methodologies, references and assumptions used for the non-energy sectors projections. These projections were generally based on limited but reasonable sets of assumptions, for example, on key developments in industrial sectors or on population of livestock. However, the ERT encourages Greece to present the assumptions used for the projections for the waste sector in a more transparent way in its next national communication, for example, by presenting more clearly the projected flows, compositions and treatment steps of solid waste.

82. In contrast to the NC4, the NC5 does not contain sensitivity analyses of the emission projections. In response to a question raised by the ERT during the review, Greece presented the results of the quantitative sensitivity analyses, which had been performed but not reported in the NC5. The sensitivity was assessed with regard to variations of the following key input parameters: international fuel prices, prices of EU ETS allowances, GDP growth and amount of waste disposed on landfills. The ERT encourages Greece to report sensitivity analysis in its next national communication in order to improve the completeness of its reporting.

2. Results of projections

83. In its NC5, Greece has reported that it expects to achieve its Kyoto Protocol target by its domestic efforts, which is supported by the information reported for both 'with measures' and 'with additional measures' scenarios.

84. In its NC5, Greece has compared its assigned amount under the Kyoto Protocol and projected aggregate total emissions (without LULUCF) for the first commitment period. Greece's assigned amount is 668.67 Tg CO_2 eq. This comparison suggests that its projected aggregate total emissions for the period 2008–2012 are 667.60 Tg CO_2 eq, or 0.2 per cent lower than the assigned amount under the 'with measures' scenario, and they are 654.69 Tg CO_2 eq, or 2.1 per cent lower than the assigned amount under the 'with additional measures' scenario. As activities under Article 3, paragraphs 3, and 4, of the Kyoto Protocol were expected to result in net removals of 4.0 Mt CO_2 eq cumulatively, according to the NC5, and if they are taken into account, Greece is expected to overachieve its target by 0.8 per cent and 2.7 per cent under the 'with measures' and 'with additional measures' scenarios, respectively.

1. 85. During the review, Greece presented the updated projections prepared in 2011. The ERT notes that the updated emission projections are considerably lower than those presented in the NC5, mainly due to the effects of the economic crisis that Greece is

currently experiencing. According to the updated projections, under the 'with measures' scenario the cumulative emissions over the first commitment period are projected to amount to 622.0 Tg CO_2 eq, or 7.0 per cent below the assigned amount, and under the 'with additional measures' scenario the emissions are projected to amount to 615.8 Tg CO_2 eq, or 7.9 per cent below the assigned amount. According to the updated information, the activities under Article 3, paragraphs 3, and 4, of the Kyoto Protocol are expected to result in net removals of 3.5 Mt CO_2 eq cumulatively, and if they are taken into account, Greece is expected to overachieve its target by 7.5 per cent and 8.4 per cent under the 'with measures' and 'with additional measures' scenarios, respectively. The key results of the emission projections are shown in table 4 and the trends are illustrated in the figure below.

86. The ERT noted that the projections reported in the NC5 do not take fully into account the effect from the EU ETS, as they include the projected emissions from the EU ETS sectors instead of the allocated allowances according to the second NAP. In order to correctly assess whether the Kyoto Protocol target will be met, the EU ETS allowances, including the new entrant reserve, would have to be taken into account. However, the updated projections provided to the ERT during the review had taken this effect into account.

87. In its NC5, Greece has presented the emission projections by sector and by gas under both the 'with measures' and 'with additional measures' scenarios. Under the 'with measures' scenario, according to the NC5, between 1990 and 2010 CO_2 emissions are projected to increase by 39.6 per cent, whereas between 1990 and 2020 they are projected to increase by 49.0 per cent. CH_4 emissions are projected to decrease by 15.6 per cent and by 29.1 per cent, respectively, and N_2O emissions are projected to decrease by 30.5 per cent and by 37.1 per cent, respectively. The F-gases (predominantly HFCs) are projected to decrease by 27.8 per cent from 1990 to 2010 and to increase by 40.2 per cent from 1990 to 2020. In the 'with additional measures' scenario presented in the NC5, CO_2 emissions are projected to increase by 37.5 per cent between 1990 and 2010 and by 27.1 per cent between 1990 and 2020.

88. According to the updated information presented by Greece during the review, under the 'with measures' scenario, total GHG emissions are projected to increase by 15.8 per cent between 1990 and 2010 and by 11.8 per cent between 1990 and 2020. In the 'with additional measures' scenario, total GHG emissions are projected to increase by 15.1 per cent between 1990 and 2010 and by 2.0 per cent between 1990 and 2020.

Table 4
Summary of greenhouse gas emission projections for Greece

	Greenhouse gas emissions (Tg CO_2 eq per year)	*Changes in relation to base year level (%)*	*Changes in relation to 1990 level (%)*
Inventory data 1990[a]	103.29	96.5	–
Inventory data 2008[a]	126.89	118.6	122.8
Kyoto Protocol base year[b]	106.99	–	103.6
Kyoto Protocol target[b]	133.73	125.0	129.5
Projections in NC5			
'With measures' projections for 2010[c]	133.06	124.4	128.8
'With additional measures' projections for 2010[c]	131.32	122.7	127.1
'With measures' projections for 2020[c]	139.60	130.5	135.2

	Greenhouse gas emissions (Tg CO_2 eq per year)	*Changes in relation to base year level (%)*	*Changes in relation to 1990 level (%)*
'With additional measures' projections for 2020[c]	121.36	113.4	117.5
Updated projections: 2011			
'With measures' projections for 2010[d]	123.91	115.8	120.0
'With additional measures' projections for 2010[d]	123.13	115.1	119.2
'With measures' projections for 2020[d]	119.55	111.8	115.8
'With additional measures' projections for 2020[d]	109.09	102.0	105.6

Data source:

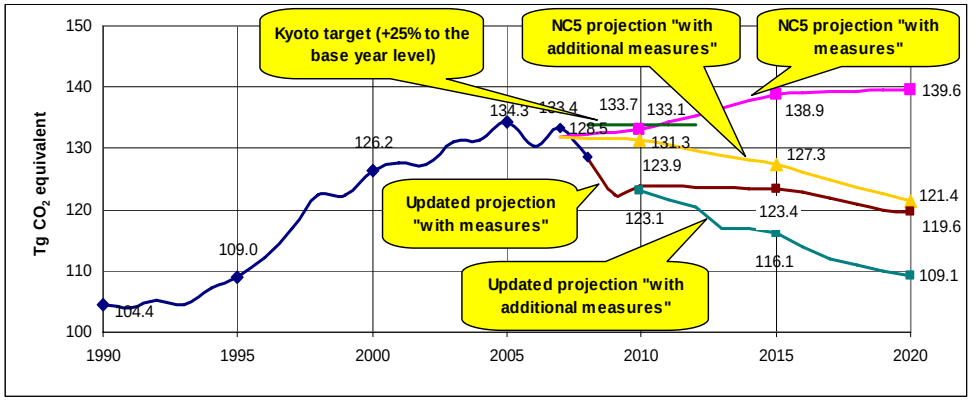
[a] Greece's 2010 GHG inventory submission; the emissions are without land use, land-use change and forestry (LULUCF);

[b] Based on the initial review report contained in document FCCC/IRR/2007/GRC;

[c] Greece's NC5;

[d] Updated projections provided by Greece during the review; the projections are for GHG emissions without LULUCF.

Greenhouse gas emission projections



Sources: (1) Data for the years 1990–2008: Greece's 2010 GHG inventory submission; the emissions are without LULUCF; (2) Data for the years 2008–2020: Greece's NC5 and updated projections provided by the Party during the in-depth review (both without LULUCF).

3. Total effect of policies and measures

89. In its NC5, Greece has reported the estimated and expected total effect of implemented and adopted PaMs by sector for the years 2005, 2010, 2015 and 2020, and of planned PaMs by sector for the years 2010, 2015 and 2020. By presenting this information, Greece has followed the previous review recommendation that the Party provide a complete section on the assessment of the aggregate effects of PaMs. Greece has reported the total effect of PaMs under the 'with measures' and 'with additional measures' scenarios in comparison with the situation without PaMs. The reported total effect of PaMs equals to the sum of the effects of individual PaMs.

90. The ERT notes that Greece has not provided information on possible overlaps or synergies between different PaMs. Also, the ERT notes that the expected effects of PaMs in

the transport sector in the 'with measures' scenario have been reported as 'not estimated' in the NC5. During the review, Greece provided the estimates of the effect of the PaMs in the transport sector that is equal to 0.3 Mt CO_2 eq. The ERT recommends that Greece estimate and report the expected effect of the PaMs in each sector, including transport in its next national communication

91. In its NC5, Greece has reported that the total effect of implemented and adopted PaMs is estimated as 28.61 Tg CO_2 eq in 2010 and 46.99 Tg CO_2 eq in 2020. The additional effect of planned PaMs is projected to be 1.74 Tg CO_2 eq in 2010 and 18.24 Tg CO_2 eq in 2020. During the review, Greece provided the updated total effect of PaMs in 2020, which took into account the updated estimates of the effect of implemented and adopted as well as planned PaMs in the energy sector in 2020 and, in particular, the effect of implemented and adopted PaMs in the transport sector.

92. According to the NC5, the largest contribution to the total effect of PaMs comes from the natural gas use, followed by the promotion of RES. All in all, the PaMs in the energy sector account for over 90 per cent of the expected total effect of PaMs. The individual PaMs are discussed in section II.B of this review. Table 5 provides an overview of the total effect of PaMs as reported by Greece.

93. According to the NC5, in the 'with measures' scenario emissions from the energy sector are projected to increase by 51.0 per cent between 1990 and 2020. In the 'with additional measures' scenario, they are projected to increase by 27.7 per cent in the same period, whereas the emissions from the industrial processes and solvents and other product use sectors, taken together, are projected to increase by 7 per cent. In the agriculture sector, the emissions are projected to decrease by 33 per cent between 1990 and 2020. In the LULUCF sector, the projections were based on a net removal trend of the period 1990–2008 and the removals are projected to increase by 74.9 per cent between 1990 and 2020. The emissions in the waste sector are projected to decrease by 48.9 per cent between 1990 and 2020.

Table 5
Projected effects of planned, implemented and adopted policies and measures in 2010 and 2020

	2010				*2020*			
Sector	*Effect of implemented and adopted measures Tg CO_2 eq)*	*Relative value (% of base year emissions)*	*Effect of planned measures (Tg CO_2 eq)*	*Relative value (% of base year emissions)*	*Effect of implemented and adopted measures[b] (Tg CO_2 eq)*	*Relative value (% of base year emissions)*	*Effect of planned measures Tg CO_2 eq)*	*Relative value (% of base year emissions)*
NC5: Energy (without CO_2 from transport)	26.09	24.4	1.69	1.6	42.48	39.7	17.12	16.0
2011 update: Energy (without CO_2 from transport)					47.00	43.9	11.40	10.7
NC5: Transport – CO_2	NE		0.05	0.0	NE		1.12	1.0
2011 update: Transport – CO_2					0.33	0.3		
Industrial processes	NA		NA		NA		NA	
Agriculture	0.63	0.6	NA		0.79	0.7	NA	
LULUCF	NA		NA		NA		NA	

	2010				2020			
Sector	Effect of implemented and adopted measures Tg CO_2 eq)	Relative value (% of base year emissions)	Effect of planned measures (Tg CO_2 eq)	Relative value (% of base year emissions)	Effect of implemented and adopted measures[b] (Tg CO_2 eq)	Relative value (% of base year emissions)	Effect of planned measures Tg CO_2 eq)	Relative value (% of base year emissions)
Waste management	1.88	1.7	NA		3.72	3.5	NA	
Total	**28.61**	**26.7**	**1.74**	**1.6**	**46.99**	**43.9**	**18.24**	**17.0**

Source: Greece's NC5 and information provided by Greece during the review.

Abbreviations: NA = not available; NE = not estimated; LULUCF = land use, land use change and forestry.

4. Supplementarity relating to mechanisms pursuant to Articles 6, 12 and 17

94. In its NC5, Greece has reported that it expects to achieve the Kyoto Protocol target during the first commitment period without the use of the Kyoto Protocol mechanisms. Therefore it has not fully exploited the opportunities or allocated a specific budget for the use of joint implementation (JI) or clean development mechanism (CDM). During the review, Greece informed the ERT that there are no plans to use the JI and CDM mechanisms to meet the Kyoto Protocol target. Therefore the ERT concluded that Greece's use of mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol fulfils the condition of supplementarity as Greece is expecting to achieve its Kyoto Protocol target with domestic efforts only.

95. Even though, according to the updated projections, Greece will not need to use certified emission reduction (CERs) or emission reduction units (ERUs) in order to achieve its Kyoto Protocol target, Greece reported that, to a limited extent, the installations covered by the EU ETS have a right to use CERs and ERUs in order to fulfil their obligations. By a provision in the second NAP for the period 2008–2012, the amount of CERs and ERUs that may be used for that purpose is limited to 9 per cent of the allowances allocated to each installation, corresponding to a total of 6.23 Mt CO_2 eq for all installations collectively for the first commitment period. This amount corresponds to 21.8 per cent of the total effect of implemented and adopted PaMs in 2010.

D. Vulnerability assessment, climate change impacts and adaptation measures

96. In its NC5, Greece has provided the required information on the expected impacts of climate change in the country, approaches to adaptation and an outline of the actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. However, the ERT notes that, in its NC5, the information on the actions taken to implement Article 4, paragraph 1(e), of the Convention on how Greece cooperates in preparing for adaptation to the impacts of climate change was provided, in order to avoid duplication, in the chapter on financial resources and technology transfer, without making any reference to this information in the chapter on vulnerability assessment, climate change impacts and adaptation measures as required by the UNFCCC reporting guidelines. The ERT recommends that Greece make a cross reference to this information in its next national communication. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC5.

Table 6
Summary of information on vulnerability and adaptation to climate change

Vulnerable area	*Examples/comments/adaptation measures reported*
Agriculture and food security	*Vulnerability:* Shorter growing season; higher risk of heat stress during flowering period; extreme events during developing period; higher risk of rainy days during sowing days; higher rainfall intensity; longer dry spells
	Adaptation: Programme of rural development for 2007–2013
Biodiversity and natural ecosystems	*Vulnerability:* Mainly decrease of species population and variety; invasion of alien species
	Adaptation: National biodiversity strategy (evaluation under the new governmental authorities); specific measures for tourist destinations
Coastal zones	*Vulnerability:* Flooding and erosion; shortage of fresh water; coastal ecosystems
	Adaptation: Specific framework for spatial planning in the tourism sector and for coastal areas; national strategy for the management of water resources; establishment of societies for the protection of species/national marine parks; specific measures for tourist destinations
Drought	*Vulnerability:* Soil degradation, salinization
	Adaptation: National action plan to combat desertification
Fisheries	*Vulnerability:* Fluctuation of marine species population
	Adaptation: Legally binding fishing code
Forests	*Vulnerability:* Forest fires, floods, loss of forest biodiversity
	Adaptation: Programme of rural development for 2007–2013, Circular of the General Secretariat on civil protection against floods
Human health	*Vulnerability:* Mainly forest fires and floods as well as air pollution aggravated by cases of extreme heat waves
	Adaptation: Circular of the General Secretariat on civil protection against floods and air pollution; public awareness
Infrastructure and economy	*Vulnerability:* Potential effect on tourism; loss of property in cases of soil erosion, forest fires and floods
	Adaptation: NA
Water resources	*Vulnerability:* Water quantity and quality
	Adaptation: National strategy for the management of water resources; national biodiversity strategy (under public consultation)

97. The ERT notes that, in its NC5, Greece has provided more detail on the required information on the possible changes to the climate and the expected impacts of climate change on different sectors of economy, compared with the information reported in the NC4. Greece reported that it initiated the studies on vulnerability of the Greek coastal areas and on the impacts of climate change relative to each geographical prefecture; these studies are to be implemented during the period 2007–2013. In addition, new research and studies have been carried out on yields of certain types of crops, tubers and legumes.

98. The impacts of climate change on biodiversity of marine ecosystems and fisheries have been estimated. The important impact of forest fires on biodiversity has been

estimated as well. In its NC5, Greece has reported the use of the outputs of the regional climate model based on the IPCC scenarios and the application of the models constructed by the National Observatory of Athens (NOA). The information in the NC5 has demonstrated the climate change impacts on agriculture, water resources, natural ecosystems, fisheries, human health and coastal zone areas.

99. The ERT notes that Greece has started preparation of its national strategy for adaptation to climate change, which it expects to complete by 2013; this is in line with the encouragement expressed by the previous ERT. The ERT reiterates the encouragement to Greece to prepare the national strategy for adaptation to climate change and report on this activity in its next national communication.

100. The national strategic plan for rural development for the period 2007–2013 identified the national priorities in the area of adaptation to climate change. The operational programme "Environment – Sustainable Development" includes the measures that could be considered as adaptation measures in the vulnerable areas. Government agencies disseminate relevant information on climate change risks and adaptive measures aimed at improving water resource management and developing adaptive technologies in the energy, agriculture, forest, fisheries and tourism sectors.

101. In its NC5, Greece has reported that it has not yet developed the national plan on coastal zone management, although there are several ongoing activities that address the climate change risks in the coastal zone. In addition, Greece has reported that its national goals for water management are fully aligned with the relevant EU legislation and, in particular, with the EU Water Framework Directive, which is fully integrated in the national legislation. In this context, preparation of updated river basin management plans is currently under way. The ERT encourages the Party to enhance the transparency of its reporting on adaptation measures and include the information on climate change adaptation technologies in vulnerable areas and indicate possible obstacles to their implementation in its next national communication.

E. Financial resources and transfer of technology, including information under Articles 10 and 11 of the Kyoto Protocol

1. Provision of financial resources, including "new and additional" resources and resources under Article 11 of the Kyoto Protocol

102. The information provided in the NC5 covers most of the reporting requirements under the Convention and its Kyoto Protocol. However, the ERT noted that bilateral financial contributions related to the implementation of the Convention, even though reported in detail by sector of activity, have not been reported using the format of table 5 of the UNFCCC reporting guidelines. An indicative list of bilateral projects by country was provided to the ERT during the review. However, Greece informed the ERT that the nature of its bilateral and regional financial contributions related to the implementation of the Convention (a large number of small-scale projects) does not facilitate a presentation of this information by country, as requested in table 5 of the UNFCCC reporting guidelines.

103. In its NC5, Greece has provided details on measures taken to give effect to its commitments under Article 4, paragraphs 3, 4 and 5, of the Convention as required by the UNFCCC reporting guidelines and under Article 11 of the Kyoto Protocol, as required by decision 15/CMP.1.

104. In its NC5, Greece has indicated what "new and additional" financial resources it has provided pursuant to Article 4, paragraph 3, of the Convention. During the review, Greece presented the updated information and clarification of how it has determined the

"new and additional" financial resources. Greece reported as "new and additional" financial resources the resources allocated as bilateral and multilateral official development assistance (ODA) to developing countries. Greece had contributed USD 607 million in 2009, of which USD 310 million were channelled as multilateral ODA and remaining USD 297 million as bilateral ODA.

105. During the review, Greece provided updated information on its allocation of financial resources for the fourth replenishment cycle of the Global Environment Facility (GEF) and informed the ERT that Greece is not expecting to provide the contribution to the GEF for the fifth replenishment due to the shortage of financial resources.

106. During the review, Greece provided the information about its assistance for financing the climate change adaptation activities from 2008 up to 2013 allocated through the following organisations: African Union for capacity building for UN negotiations (EUR 12 million for 4 years); Caribbean Community for support to a special programmme on adaptation to climate change (EUR 4 million for 4 years); World Meteorological Organization for support to national weather monitoring systems in Burkina Faso, Chad, Mali, Niger, Sudan and Uganda (EUR 2 million for 2 years); and Indian Ocean Commission for capacity building in Comoros, Reunion, Madagascar, Mauritius, Seychelles (EUR 4 million for 4 years).

107. Overall responsibility for development cooperation lies with the Ministry of Foreign Affairs, where the General Directorate for international cooperation is responsible for the coordination of programming, the allocation of multilateral and bilateral funding and the monitoring of development cooperation. In its NC5, Greece has reported the information on its bilateral financial contributions related to the implementation of the Convention according to the UNFCCC reporting requirements. However, this information has been presented by mitigation and adaptation priority areas and by year, but not by the recipient country or region. During the review, Greece provided the updated information on climate-related aid allocated through the bilateral ODA channels that amounted to USD 75.9 million over the period 2006–2009. The ERT encourages Greece to enhance the transparency of its reporting in its next national communication, by including information on bilateral financial contributions reported as indicated in table 5 of the UNFCCC reporting guidelines.

108. During the review, Greece provided the updated information on the fast-track financing for climate change programmes and on its 2010 disbursement of USD 5.9 million to programmes and actions related to climate change mitigation and adaptation under this category. According to the information provided during the review, Greece had provided a cumulative contribution to multilateral funds and programmes related to the environment and climate change of USD 34.15 million for the years 2006–2009. Table 7 summarizes information on financial resources and technology transfer.

Table 7
Summary of information on financial resources for 2006–2009

Channel of financial resources (USD million)	*Years of disbursement*				
	2006	*2007*	*2008*	*2009*	*Total 2006–2009*
Official development assistance (ODA)	423.99	500.82	703.16	607.27	2 235.24
Climate-related aid in bilateral ODA	20.15	23.41	11.40	20.89	75.85
Climate-related support programmes[a]	3.29	10.56	7.04	5.35	26.24

Channel of financial resources (USD million)	*Years of disbursement*				
	2006	*2007*	*2008*	*2009*	*Total 2006–2009*
Contributions to fourth replenishment of the GEF			5.90	2.01	7.91
Pledge for fourth replenishment of the GEF					7.99

Abbreviation: GEF = Global Environment Facility.

[a] Allocated through United Nations climate-related funds and special adaptation programmes in cooperation with multilateral organizations (African Union, Caribbean community, World Meteorological Organization and Indian Ocean Committee).

2. Activities related to transfer of technology, including information under Article 10 of the Kyoto Protocol

109. In its NC5, Greece has provided information on measures related to the promotion, facilitation and financing of the transfer of environmentally sound technologies. However, the ERT notes that in its NC5, Greece had not clearly distinguished between the activities undertaken by the public sector and those undertaken by the private sector. During the review, Greece clarified that there are no legal provisions for activities in this field to be undertaken by the private sector and this is why it was not feasible for the Party to indicate in what way it has encouraged the private sector activities and how these activities help to meet the commitments under Article 4, paragraphs 3, 4 and 5, of the Convention. The ERT reiterates the previous review recommendation that Greece report on the activities to promote the technology transfer. In addition, the ERT recommends that Greece report, as far as is feasible, on the activities undertaken by the private sector and by the public sector and include the information on the success and failure stories in technology transfer to improve the transparency of its reporting.

110. In its NC5, Greece has reported its activities related to technology transfer using table 6 of the UNFCCC reporting guidelines and has reported on financing access by developing countries to 'hard' or 'soft' environmentally sound technologies in a summary format. During the review, further analysis of this information was provided by the Party. Greece has reported on the activities it has undertaken in South-Eastern Europe, the Middle East and Northern Africa within the framework on the Mediterranean component of the EU Water Initiative (MED EUWI), as well as the activities to finance RES and energy efficiency projects in the Black Sea region through the Black Sea Economic Cooperation Organization. In addition, Greece reported on its technology transfer efforts through bilateral projects in a number of developing countries, aiming to facilitate the access to environmentally sound technologies and to promote the use of RES. The ERT encourages Greece to report in more detail on indicative activities for financing access by developing countries to environmentally sound technologies and, in particular, transfer of adaptation technologies to vulnerable countries, in its next national communication.

111. In its NC5, Greece has provided information on steps taken by the Government to promote, facilitate and finance transfer of technology, and to support the development and enhancement of endogenous capacities and technologies of developing countries by providing examples of its activities within the MED EUWI. During the review, further related information was provided to the ERT. The ERT recommends that, in its next national communication, Greece include further information on its support for the development and enhancement of endogenous capacities and technologies of developing countries to improve the completeness of its reporting.

112. Greece focused its technology transfer efforts on programmatic approaches and bilateral cooperation. The ERT notes that the activities on technology transfer were focused on mitigation and adaptation technologies, and also notes that more detailed information was provided on mitigation technologies. In its NC5, Greece stated that it currently does not have a priority on capacity-building for CDM and JI projects in developing countries because it expects to achieve the Kyoto Protocol target without the use of the Kyoto Protocol mechanisms.

F. Research and systematic observation

113. In its NC5, Greece has provided information on actions relating to research and systematic observation, which addressed both domestic and international activities. Greece has provided summary information on global climate observation system (GCOS) activities. According to its NC5, Greece contributes to the GCOS via data acquired through the Hellenic National Meteorological Service (HNMS) observational network. Four stations of the HNMS observational network report to the GCOS the data on air temperature and precipitation. During the review, Greece provided information about network problems and capacity-building requirements for the national system of climate observation.

114. In Greece, climate research activities are performed by the NOA, Academy of Athens, Hellenic centre for marine research, NTUA and universities in Athens and Thessaloniki. Each of these institutions has the topic of climate change and its impact as one of the priority areas of their research programmes; the research activities are focused on impacts on water, forestry, marine ecosystems, extreme weather events as well as new mitigation and adaptation technologies. During the review, Greece provided information on its current research activities, the results of latest research on past climate and climate change impacts and ways to further advance the research activities on mitigation and adaptation technologies. The ERT encourages Greece to include this information in its next national communication.

115. The NC5 has also presented information on actions to address capacity building in the developing countries through research activities financed through the bilateral and transnational programmes. During the review, Greece provided more detailed information on such programmes and funding allocated from the Greek research fund. These programmes include various projects that are directly or indirectly related to climate change observation, mitigation and adaptation actions.

116. Greece presented information about its research institutes involved in the government-funded marine scientific research on regional coastal models and observation systems and forecasting networks. The existing POSEIDON system for monitoring, forecasting and information collection on marine ecosystems uses sea and atmospheric data collection network in the Mediterranean Sea.

G. Education, training and public awareness

117. In its NC5, Greece has reported on activities related education, training and public awareness that address both domestic and international activities. The reported information has been transparently presented. The NC5 gives more comprehensive information when compared with the NC4, in particular on: general policy toward education, training and public awareness; programmes on environmental education; the structure of the educational system; education for sustainable development; cooperation at the national and international level; and educational projects and experimental workshops. Such activities are delivered through the mainstream education institutions as well as through a network of

63 environmental education centres co-funded by the National Strategic Reference Framework for 2007–2013 (up to 60 per cent of costs) and the EU funds (up to 40 per cent of costs).

118. Various governmental, professional and non-governmental organizations are involved in awareness-raising and training activities. The central and municipal governments give high priority to public consultation and awareness-raising as well as public campaigns aimed at the promotion of environmentally friendly and climate-conscious lifestyles. The MEECC contributes to the promotion of environmental education and training through the dissemination of publications for children. The Hellenic association of teachers for environmental education, established in 1992, provides support and training, and encourages information exchange between teachers from all levels of education system. Environmental learning is promoted through the lifelong learning and adult training organizations.

119. The NC5 provides detailed information on public awareness of climate change actions carried out under the auspices of a number of public bodies and NGOs. The National Centre for Environment and Sustainable Development has been established as a platform for opinion exchange, information dissemination and consultation between the Government and various stakeholder groups. The ERT encourages the Party to report the extensive information in a more concise and structured way and highlight the priorities and best practices in this area to improve the transparency of reporting in its next national communication.

H. Evaluation of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

120. Greece has provided all of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in its NC5. The supplementary information is placed in different sections of the NC5. Table 8 provides an overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol as well as references to the NC5 chapters in which this information is provided. The technical assessment of the information reported under Article 7, paragraph 2 is contained in the relevant sections of this report.

Table 8
Overview of supplementary information under Article 7, paragraph 2, of the Kyoto Protocol

Supplementary information	*Reference in NC5*
National registry	Chapter 3.4
National system	Chapter 3.3
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Chapter 5.3
Policies and measures in accordance with Article 2	Chapter 4
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Chapter 4.2
Information under Article 10	Chapter 7
Financial resources	Chapter 7

I. Minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol

121. Greece has reported the information requested in section H. Minimization of adverse impacts, in accordance with Article 3, paragraph 14, of the annex to decision 15/CMP.1 as part of its 2010 annual submission. During the in-country review, Greece provided the ERT with the additional information on how it strives to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. The ERT considers the reported information to be transparent and complete. The ERT commends Greece for the additional information provided and encourages it to continue exploring and reporting on the adverse impacts of the response measures.

122. In its NC5, Greece has reported that impacts on third countries are mostly indirect and frequently cannot be attributed to a specific policy. It also reported that most of its policies are based on the EU policies which are subject to an impact assessment. Two such policies (promotion of biomass and biofuels, and the extension of the EU ETS to the aviation sector) have been identified as having potential impacts on developing countries. For the biofuels policy, potential commercial positive impacts and potential negative impacts on soil, biodiversity, water and land use patterns have been identified. Greece has reported that 'sustainability criteria' have been designed to address potential negative impacts. During the review, Greece presented several initiatives which give priority to: specific actions such as the reduction of market imperfections by the liberalization of the energy market; cooperating in the development and transfer of less GHG-emitting fossil fuel technologies (namely, in the scope of EU work, on the development and dissemination of carbon capture and storage technologies); strengthening the capacity of developing country Parties; and assisting developing country Parties which are highly dependent on the export and consumption of fossil fuels in diversifying their economies.

III. Conclusions and recommendations

123. The ERT concludes that the NC5 generally provides a good overview of the national climate policy of Greece. The information provided in the NC5 includes almost all of the mandatory information required by the UNFCCC reporting guidance and all elements of the supplementary information under Article 7 of the Kyoto Protocol. During the review, Greece provided the additional missing information on the PaMs by sector, subdivided by GHG and supplemented by a summary table on PaMs for each sector.

124. Greece's total GHG emissions for 2008 were estimated to be 23.1 per cent above its 1990 level, excluding LULUCF, and 22.9 per cent above, including LULUCF. Emission increases were driven by strong economic growth, increased population, improvements in living standards, increased vehicle fleet and road transportation activities, and continued reliance on fossil fuels for primary energy supply.

125. In its NC5, Greece presents GHG projections for the period 2008–2020. Two scenarios are included: 'with measures' and 'with additional measures'. According to the NC5, the projected GHG emissions in 2010 under the 'with measures' and the 'with additional measures' scenarios are 24.4 per cent and 22.7 per cent above the base year, respectively. The updated projections provided during the review demonstrate that the projected GHG emissions in 2010 under the 'with measures' and the 'with additional measures' scenarios reflect the impact from the recent economic crisis and suggest that Greece may see a more moderate growth in emissions compared to the scenarios presented in the NC5, and this growth is estimated at 15.8 per cent and 15.1 per cent above the base

year, respectively. Thus, the projections indicate that Greece can meet its Kyoto Protocol target (which is a limit of 25 per cent increase over the base year emissions), with domestic effort alone even under the 'with measures' scenario. The GHG emissions have declined since 2007 and are projected to decrease further after 2010 until 2020, according to the updated projections.

126. The NC5 contains information that Greece does not plan to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target during the first commitment period as it expects to meet its target with domestic efforts alone. The ERT considers that the information reported by Greece in the NC5 is clear in that the domestic action is the main element of the effort made to meet its Kyoto Protocol target.

127. Greece has adopted the strategy for sustainable development and the second national climate change programme, which define the climate change policy framework, set the climate change mitigation as one of the sustainable development priorities and identify the additional measures needed to meet the Kyoto Protocol target. The Greece's NEEAP, NREAP and the plan to achieve the EU's 20-20-20 targets set the mid-term climate change targets and defines the economic development trajectory. The natural gas use and the EU ETS are the PaMs with the greatest impact on emission reduction.

128. Greece has provided information on its cumulative contributions to UN and other multilateral environmental funds and programmes, which amount to USD 34.15 million for the years 2006–2009, mainly in the form of grants and technical assistance. Greece reported as "new and additional" financial resources the resources allocated as bilateral and multilateral ODA to developing countries which represent new commitments undertaken within the aforementioned period for climate change programmes. Greece has reported its activities related to technology transfer and financing access by developing countries to 'hard' or 'soft' environmentally sound technologies in South-Eastern Europe, the Middle East and Northern Africa and in the Black Sea region.

129. The NC5 of Greece has presented information on the expected impacts of climate change for each geographic prefecture, and the approaches and actions on adaptation in key sectors of economy. Greece has started to prepare the national strategy for adaptation to climate change, which it expects to complete by 2013. The information reported by Greece in the NC5 suggests an increased attention given by Greece to matters related to climate change impacts and adaptation.

130. Greece provided comprehensive information on the actions relating to education, training and public awareness. The NC5 gives more comprehensive information when compared with the NC4, in particular on: general policy toward education, training and public awareness; programmes on environmental education; the structure of the educational system; education for sustainable development; cooperation at the national and international level; and educational projects and experimental workshops.

131. Greece has provided information on actions relating to research and systematic observation, which addressed both domestic and international activities, and summary information on GCOS activities.

132. The ERT concluded that Greece's national system continues to perform its required functions as set out in decision 19/CMP.1; that the national registry continues to perform the functions set out in decision 13/CMP.1 and decision 5/CMP.1, and continues to adhere to the technical standards for data exchange between registry systems in accordance with relevant CMP decisions. The ERT notes that updates of database and applications, implemented security measures and changes to the national registry software are documented on a regular basis by nominated responsible persons.

133. Supplementary information under Article 7, paragraph 1, of the Kyoto Protocol on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, provided by the Party in its 2009 and 2010 annual submissions, is complete and transparent. The ERT encourages Greece to further enhance the reporting on Article 3, paragraph 14, of the Kyoto Protocol including by indicating, in implementing its commitments under Article 3, paragraph 1, the priority being given to the action that can help to minimize the adverse impacts.

134. In the course of the IDR, the ERT formulated several recommendations relating to the completeness, transparency and timeliness of Greece's reporting under the Convention and its Kyoto Protocol. The key recommendations[5] are that Greece:

(a) Improve the completeness of reporting by including in the next national communication the following information:

(i) Textual descriptions of the PaMs for each sector, together with a summary table on PaMs by sector and by affected GHG;

(ii) More detailed information on how Greece believes its PaMs modify longer-term trends in emissions and removals;

(iii) Information on the emission reduction impacts of the implemented and adopted PaMs, and planned PaMs in the LULUCF sector in the tabular format;

(iv) More detailed information on support to development and enhancement of endogenous capacities and technologies of developing countries;

(b) Improve the transparency of reporting by including the following:

(i) A clearer definition of the 'with measures' scenario;

(ii) Information on the activities undertaken by the private sector and by the public sector to promote, facilitate and finance the transfer and access to technologies and include the information on success and failure stories in technology transfer;

(c) Improve the timeliness of reporting by submitting its next national communication in a timely manner.

135. The ERT recommends that the Party strengthen the implementation of the security measures put in place to prevent and resolve unauthorized manipulations of national registry according to paragraph 115(e) of the annex to decision 22/CMP.1.

136. The ERT encourages Greece to undertake a number of improvements regarding completeness and transparency of reporting; the most important of these are that the Party:

(a) Provide further information on:

(i) The updated explanation of the driving factors of emission trends in the energy sector and the description of GHG emission and removal trends for the LULUCF sector;

(ii) The more detailed presentation of each PaM; the evolution of the PaMs, their alterations and the effects achieved; the interaction of the PaMs with each other or complementing each other at the national level;

(iii) Policies and practices which encourage activities that lead to greater levels of anthropogenic GHG emissions and information on how Greece intends to address them;

[5] The recommendations are given in full in the relevant sections of this report.

(iv) The funding sources for PaMs and the costs and benefits of individual PaMs;

(v) The methods used to estimate the emission reduction potential of individual PaMs or collections of PaMs and their non-GHG mitigation benefits;

(vi) The clearer presentation of the assumptions used for the emission projections;

(vii) The main differences in the methods used for energy-related emission projections in the current and previous national communications;

(viii) The indicative activities for financing access by developing countries to environmentally sound technologies and, in particular, transfer of climate change adaptation technologies to vulnerable countries;

(ix) The climate change adaptation technologies in vulnerable areas and the indication of possible obstacles for their implementation;

(x) The bilateral financial contributions allocated by region or country reported;

(b) Report a description of the way in which progress of the PaMs is monitored and evaluated over time;

(c) Report the sensitivity analysis for the projections;

(d) Report the extensive information on activities in education, training and public awareness in a more concise and structured way and highlight the priorities and best practices;

(e) Continue exploring and reporting on the adverse impacts of the response measures to minimize the adverse effects and impacts in accordance with Article 2, paragraph 3, and Article 3, paragraph 14, of the Kyoto Protocol.

IV. Questions of implementation

137. During the review the ERT assessed the NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, and reviewed information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, with regard to timeliness, completeness and transparency. No question of implementation was raised by the ERT during the review.

Annex

Documents and information used during the review

A. Reference documents

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories". FCCC/CP/1999/7. Available at <http://unfccc.int/resource/docs/cop5/07.pdf>.

"Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol". Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

"Guidelines for review under Article 8 of the Kyoto Protocol". Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

FCCC/SBI/2007/INF.6. Compilation and synthesis of fourth national communications. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf06.pdf>.

FCCC/SBI/2007/INF.6/Add.1. Compilation and synthesis of NC4s, Add.1: Policies, measures, past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf06a01.pdf>.

FCCC/SBI/2007/INF.6/Add.2. Compilation and synthesis of NC4s, Add.2: Financial resources, technology transfer, vulnerability, adaptation and other issues relating to the implementation of the Convention by Parties included in Annex I to the Convention. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf06a02.pdf>.

FCCC/SBI/2007/INF.7. Compilation and synthesis of supplementary information incorporated in fourth national communications submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol. Available at <http://unfccc.int/resource/docs/2007/sbi/eng/inf07.pdf>.

FCCC/ARR/2009/GRC. Report of the individual review of the greenhouse gas inventory of Greece submitted in 2009. Available at <http://unfccc.int/resource/docs/2010/arr/grc.pdf>.

FCCC/IRR/2007/GRC. Report of the review of the initial report of Greece. Available at <http://unfccc.int/resource/docs/2007/irr/grc.pdf>.

FCCC/IDR.4/GRC. Report on the in-depth review of the fourth national communication of Greece. Available at <http://unfccc.int/resource/docs/2007/idr/grc04.pdf>.

Fourth national communication of Greece. Available at <http://unfccc.int/resource/docs/natc/grenc4.pdf>.

2009 GHG inventory submission of Greece. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/4771.php>.

2010 GHG inventory submission of Greece. Available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Afroditi Kotidou (MEECC), including additional material on updated policies and measures, GHG projections, the national registry and recent climate policy developments in Greece. The following documents[1] were also provided by Greece:

Energy efficiency action plan, 2008. Available at <http://www.emeees.eu>.

National renewable energy action plan in the scope of EU Directive 2009/28/EC. Available at <http://www.ypeka.gr/LinkClick.aspx?fileticket=CEYdUkQ719k%3D&tabid=37>

[1] Reproduced as received from the Party.