



United Nations

FCCC/IDR.5/BGR



Framework Convention on
Climate Change

Distr.: General
30 July 2012

English only

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

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 Bulgaria conducted by an expert review team in accordance with the relevant provisions of the Convention and Article 8 of the Kyoto Protocol.

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I. Introduction and summary

A. Introduction

1. For Bulgaria, the Convention entered into force on 10 August 1995 and the Kyoto Protocol on 16 February 2005. Under the Kyoto Protocol, Bulgaria committed itself to reducing its greenhouse gas (GHG) emissions by 8 per cent compared with the base year¹ (1988) 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 Bulgaria, 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 6 to 11 February 2012 in Sofia, Bulgaria, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Mr. Kamel Djemouai (Algeria), Mr. Sandro Federici (San Marino), Mr. Rostislav Neveceral (Czech Republic) and Mr. Adam Pogorzelski (Poland). Mr. Federici and Mr. Neveceral 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 Bulgaria 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 Bulgaria in its 2010 annual submission and elaborated further in its 2011 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 Bulgaria, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

B. Summary

5. The ERT noted that Bulgaria's NC5 complies in general 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 Protocol² is provided in the NC5. Bulgaria considered some of the recommendations provided in the report on the in-depth review of the fourth national communication of Bulgaria.³ The ERT commended Bulgaria for its improved reporting.

6. The supplementary information on the minimization of adverse impacts referred to in paragraph 3 above is partly complete and partly transparent. During the review, Bulgaria provided further relevant information.

¹ "Base year" refers to the base year under the Kyoto Protocol, which is 1988 for carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), and 1995 for perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF₆). 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/BGR.

1. Completeness

7. The NC5 covers all sections required by the UNFCCC reporting guidelines and most of the supplementary information under Article 7, paragraph 2, of the Kyoto Protocol, except for some information on the national registry (see para. 25 below). The NC5 does not include some of the information required by the UNFCCC reporting guidelines on: description of how the national circumstances affect GHG emissions and removals over time (see para. 11 below); reporting on policies and measures (PaMs) for the industrial processes and the land use, land-use change and forestry (LULUCF) sectors; PaMs for perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF₆) (treating PFCs and HFCs collectively) (see para. 30 below); projections on a gas-by-gas basis for PFCs, HFCs and SF₆; projections for the LULUCF and solvent and other product use sectors; projections presented together with actual data for the base year (1988) in accordance with Article 4, paragraph 6, of the Convention (see para. 77 below); the estimated and expected total effect of implemented and adopted PaMs (see para. 95 below); and information on the action taken to support capacity-building in the area of research and systematic observation in developing countries (see para. 111 below). During the review, the Party provided all missing information. The ERT recommends that Bulgaria enhance the completeness of its reporting by including this information in its next national communication.

2. Transparency

8. The ERT acknowledged that Bulgaria's NC5, including supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, is generally comprehensive and transparent. 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. In the course of the review, the ERT formulated a number of recommendations that could help Bulgaria to further increase the transparency of its reporting with regard to PaMs (see para. 32 below).

3. Timeliness

9. The NC5 was submitted on 12 February 2010, after the deadline of 1 January 2010 mandated by decision 10/CP.13. Bulgaria informed the secretariat about its difficulties with the timeliness of its national communication submission on 22 December 2009 in accordance with paragraph 139 of decision 22/CMP.1. The ERT noted with concern the delay in the submission of the NC5. The NC5 was resubmitted on 15 November 2011 and on 21 January 2012.

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, Bulgaria has provided a concise description of the national circumstances and has elaborated on the framework legislations and key policy documents on climate change. The NC5 also refers to the description of the national system provided in the Party's initial report under Article 7, paragraph 4, of the Kyoto Protocol (decision 13/CMP.1) submitted in 2007 and updated in 2008,⁴ and the national inventory report

⁴ Party's Initial Report under the Kyoto Protocol. Report to facilitate the calculation of the assigned

(NIR) of the 2009 annual submission. Further technical assessment of the institutional and legislative arrangements for the coordination and implementation of PaMs is provided in section II.B.1 of this report.

1. National circumstances

11. In its NC5, Bulgaria has provided a description of its national circumstances and some information on how these national circumstances affect GHG emissions and removals in Bulgaria and how changes in the national circumstances affect GHG emissions and removals over time. The Party has also provided information on the government structure, population, geography, climate, economy and relevant economic sectors. However, Bulgaria did not provide a clear and comprehensive description of how the national circumstances affect GHG emissions and removals over time. The ERT recommends that Bulgaria report, in its next national communication, this information and encourages Bulgaria to provide more transparent information on how its national circumstances are relevant to factors affecting emissions and removals over time, and to explain the relationship between the national circumstances and the GHG emissions and removals. Table 1 illustrates the national circumstances of the country by providing some indicators relevant to GHG emissions and removals.

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

Indicator	1990	1995	2000	2005	2009	Change 1990– 2000 (%)	Change 2000– 2009 (%)	Change 1990– 2009 (%)
Population (million)	8.72	8.40	8.06	7.74	7.59	-7.6	-5.8	-13.0
GDP (2000 USD billion using PPP)	56.52	49.51	50.08	65.38	74.84	-11.4	49.4	32.4
TPES (Mtoe)	28.57	23.10	18.65	19.89	17.48	-34.7	-6.3	-38.8
GDP per capita (2000 USD thousand using PPP)	6.48	5.89	6.21	8.45	9.87	-4.2	58.9	52.3
TPES per capita (toe)	3.28	2.75	2.31	2.57	2.30	-29.6	-0.4	-29.9
GHG emissions without LULUCF (Tg CO ₂ eq)	124.51	80.84	63.35	67.11	59.50	-49.1	-6.1	-52.2
GHG emissions with LULUCF (Tg CO ₂ eq)	110.37	67.96	53.08	55.78	47.71	-51.9	-10.1	-56.8
CO ₂ emissions per capita (Mg)	10.70	7.25	6.86	6.81	7.53	-35.9	9.8	-29.6
CO ₂ emissions per GDP unit (kg per 2000 USD using PPP)	1.65	1.23	1.10	0.81	0.76	-33.3	-30.9	-53.9
GHG emissions per capita (Mg CO ₂ eq)	14.28	9.62	7.86	8.67	7.84	-45.0	-0.3	-45.1
GHG emissions per GDP unit (kg CO ₂ eq per 2000 USD using PPP)	2.20	1.63	1.27	1.03	0.79	-42.3	-37.8	-64.1

Sources: (1) GHG emissions data: Bulgaria's 2011 greenhouse gas 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.

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.

amount pursuant to Article 3, paragraphs 7 and 8, of the Kyoto Protocol., available at http://unfccc.int/national_reports/initial_reports_under_the_kyoto_protocol/items/3765.php.

12. Bulgaria is a presidential republic. Overall responsibility for climate change policymaking lies with the Ministry of Environment and Water (MoEW); a number of Government institutions are involved in the implementation of the policy (see para. 38 below). The implementation of the Kyoto Protocol is underpinned by the Environmental Protection Act and the amendment of the Environmental Protection Act approved in 2010 that created the main legal framework for the Bulgarian green investment scheme (GIS). However, it is expected that the Climate Change Act will be adopted by the end of 2012; and all sectoral climate change policies will then come under the framework of this Act.

13. Since Bulgaria's accession to the European Union (EU) in 2007, the EU legislation has played a fundamental role in the climate change policymaking in Bulgaria (see para. 40 below). Bulgaria transposed the EU legislation, such as the EU Climate and Energy Package, which set a target of a 20 per cent emission reduction compared to the 2005 level by 2020. The measures related to climate change are included in the Second National Action Plan on Climate Change (NAPCC), and a Third NAPCC should be adopted by the end of 2012. 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 section II.B of this report.

14. In accordance with Article 4, paragraph 6, of the Convention and decision 9/CP.2, Bulgaria, as a Party with an economy in transition, may use 1988 as its base year.

15. Bulgaria has provided a summary of information on GHG emission trends for the period 1990–2008. This information is broadly consistent with the 2010 annual inventory submission. Summary tables, including trend tables for emissions in carbon dioxide equivalent (CO₂ eq) (given in the common reporting format (CRF)), are also provided in an annex to the NC5. During the review, Bulgaria presented the emission estimates from the 2011 annual inventory submission; the ERT assessed the estimates and has reflected the findings in this report.

16. Total GHG emissions,⁵ excluding emissions and removals from LULUCF, decreased by 52.2 per cent between the base year and 2009, whereas total GHG emissions, including net emissions and removals from LULUCF, decreased by 56.8 per cent. This was mainly attributed to carbon dioxide (CO₂) emissions, which decreased by 50.9 per cent over this period. Emissions of methane (CH₄) also decreased by 46.4 per cent, while emissions of nitrous oxide (N₂O) decreased by 68.6 per cent, but their share remains very small. A major part of these decreases was experienced in the 1990s, while during the 2000s the emission trends almost stabilized. More specifically, the emission trends by gas for the period 2000–2009 are as follows: CO₂ emissions decreased by 3.9 per cent, CH₄ emissions decreased by 21.3 per cent, N₂O emissions decreased by 9.2 per cent and total GHG emissions decreased by 6.5 per cent. Emissions of fluorinated gases (F-gases) accounted for about 0.003 per cent of total GHG emissions in 1988 and 0.5 per cent in 2009. Trends in total GHG emissions were mostly underpinned by emission trends in the energy sector (see para. 42 below). An analysis of the key drivers of the GHG emission trends in each sector is provided in section II.B of this report. Table 2 provides an overview of GHG emissions by sector from 1988 to 2009.

⁵ In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO₂ eq excluding LULUCF, unless otherwise specified.

Table 2
Greenhouse gas emissions by sector in Bulgaria, 1988–2009

Sector	GHG emissions (Tg CO ₂ eq)						Change (%)		Shares ^a by sector (%)	
	1988 ^b	1995	2000	2005	2008	2009	1988 ^b –2009	2008–2009	1988 ^b	2009
1. Energy	85.35	55.93	44.03	48.56	51.63	45.08	–47.2	–12.7	68.5	75.8
A1. Energy industries	40.28	27.29	24.12	27.13	32.03	29.67	–26.3	–7.4	32.3	49.9
A2. Manufacturing industries and construction	20.38	17.89	10.06	9.51	6.98	3.63	–82.2	–48.0	16.4	6.1
A3. Transport	7.25	4.52	5.60	7.68	8.52	8.22	13.4	–3.5	5.8	13.8
A4.–A5. Other	14.73	4.13	2.41	2.38	2.09	1.84	–87.5	–12.0	11.8	3.1
B. Fugitive emissions	2.70	2.11	1.84	1.86	2.01	1.71	–36.6	–14.8	2.2	2.9
2. Industrial processes	12.40	10.07	6.49	6.67	6.08	3.44	–72.3	–43.5	10.0	5.8
3. Solvent and other product use	0.90	0.10	0.07	0.05	0.05	0.05	–94.7	–6.4	0.7	0.1
4. Agriculture	19.01	8.11	6.80	6.54	6.32	6.18	–67.5	–2.1	15.3	10.4
5. LULUCF	–14.14	–12.89	–10.28	–11.34	–11.57	–11.78	–16.7	1.9	–11.4	–19.8
6. Waste	6.85	6.64	5.97	5.29	4.95	4.76	–30.5	–4.0	5.5	8.0
7. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
GHG total with LULUCF	110.37	67.96	53.08	55.78	57.47	47.71	–56.8	–17.0	NA	NA
GHG total without LULUCF	124.51	80.84	63.35	67.11	69.03	59.50	–52.2	–13.8	100.0	100.0

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.

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

^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.

^b Bulgaria's base year.

17. The ERT noted that the main drivers of emission trends in Bulgaria include the following: the decrease in economic output in the 1990s, the continuous decrease in the country's population, the restructuring of economic activity and of primary energy use, and structural changes in the transport sector (due to the changes in ownership from public to private vehicle park and the shift from the dominance of rail and water transport to road transport). During the 1990s, the Party experienced a large decrease in emissions and a significant slowdown in economic activity, driven by the transition to a market-based economy (see para. 18 below). Gross domestic product (GDP) has decreased significantly during the period 1990–2000. Since 2000 it has recovered, and in 2009 it was 32.4 per cent above the 1990 level. During the period 2000–2009, the economy regained and this period is characterized by a relative decoupling of the GHG emission trend from economic growth, measured by GDP growth rates, and a relative decarbonization of the economy, measured by GHG emissions per GDP unit. Bulgaria experienced a steady declining population trend during the period 1990–2009, which resulted in the reduction of population by 13.0 per cent.

18. The main reasons for the declining GHG emission trend in Bulgaria are the restructuring of economic activity due to the radical transition process from a centrally-

planned economy to a market-based economy and subsequent economic slowdown. This led to a decrease in demand for electricity and decrease in power production from thermal power stations (and an increase in power production from hydropower and nuclear power plants), structural changes in industry (including a decline in production by energy-intensive enterprises and energy efficiency improvements), the introduction of energy efficiency measures in the residential sector and a shift from solid and liquid fuels to natural gas in primary energy consumption. This also led to a decrease in GHG emissions from the agriculture sector stemming from the decline in the cattle and sheep populations and the use of fertilizers.

19. The ERT noted that the reported information on the national circumstances does not provide a sufficient understanding of the drivers of the trend of emissions and removals, both for the level and for the trend. Further, the ERT believes that the analysis of the national circumstances should provide the Party with the insights on climate change policies that may be identified and implemented to promote sustainable development as noted in paragraph 34 of decision 15/CMP.1. The ERT encourages Bulgaria to provide, in the chapter on national circumstances, background information relevant to the GHG emissions and removals, the PaMs and the projection scenarios (see para. 11 above).

20. The ERT further encourages Bulgaria to provide more transparent and detailed information on its national circumstances, structured in accordance with paragraph 8 of the UNFCCC reporting guidelines including on: the population distribution over the territory and the distribution subdivided by age and activity; the location of natural resources and their suitability for energy production; distribution of renewable resources; indoor heating degree days; electricity imports and exports; the sources of energy used for the different sectors; the impact of fiscal policies on the GHG trend and level; the fiscal regime for fossil fuels and energy; the types of industrial installation and their technological efficiency; and the management of and cultural practices for the agriculture and forestry sectors.

2. National system

21. In accordance with decision 15/CMP.1, Bulgaria has 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, of the Kyoto Protocol (decision 19/CMP.1). The Party has also provided a reference to the 2009 annual submission, which contains a more detailed description of the national system. The description includes all of the elements as required by decision 15/CMP.1. The ERT encourages the Party to further improve the description of the inventory preparation process by providing a concise description, not limited to the energy sector, of the following steps in the inventory preparation process: planning; collection of data (including the quality control procedures for the activity data and emission factors); and preparation of estimates and drafting of the NIR.

22. Bulgaria has provided a description of the 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 contributes to the conservation of biodiversity and the sustainable use of natural resources (see paras. 66–67 below).

23. During the review, Bulgaria provided additional information on the plan to increase the capacity of the national system to provide a consistent land representation of activities under Article 3, paragraph 3, of the Kyoto Protocol. The ERT noted the ongoing planned activities and encourages Bulgaria to consider collecting additional activity data, such as records of new forest plantations since 1990, and using remotely sensed data for verification, in order to improve the accuracy of the estimates and ensure that the necessary

data are available for the reporting on the LULUCF activities under Article 3, paragraph 3, of the Kyoto Protocol.

24. The ERT noted that the report of the individual review of the 2010 annual submission of Bulgaria⁶ states that the institutional, legal and procedural arrangements (established and formalized by the Ordinance by the Council of Ministers on the approach and order of the organization of the national inventories of hazardous substances from greenhouse gases in the ambient air⁷ that entered into force on 21 September 2010) are fully operational. The ERT further noted that Bulgaria has the institutional arrangements and capacity (including the arrangements for the technical competence of the staff involved in the national system) in place to plan, prepare and manage the national inventory on an annual basis. The ERT concluded that the national system continues to perform its required functions as set out in decision 19/CMP.1.

3. National registry

25. In its NC5, Bulgaria has provided information on the national registry, including a description of 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 standards for data exchange between registry systems. The description of the national registry does not include the following elements: a description of the database structure and capacity; a description of the procedures to minimize discrepancies in the issuance, transfer, acquisition, cancellation and retirement of Kyoto Protocol units; and a description of the measures taken to safeguard, maintain and recover data in order to ensure the integrity of data storage and the recovery of registry services in the event of a disaster.

26. During the review, Bulgaria provided additional information on the measures put in place to safeguard, maintain and recover registry data, the security measures to prevent unauthorized manipulations and protect the registry against security compromises, the test procedures related to the performance of the current version of the national registry, and the recording of the changes to and discrepancies in the national registry, as required by the mandatory reporting elements in accordance with paragraph 32(a–j) of decision 15/CMP.1. In response to questions raised by the ERT during the review, Bulgaria provided documents demonstrating how it records the changes to the national registry and how it maintains these records. The ERT noted that the updates of databases and applications, the implementation of security measures, and changes to the national registry software are documented on a regular basis by Kontrax, the company contracted to maintain the registry operations, and the Executive Environment Agency.

27. The ERT took note of the conclusion of the standard independent assessment report⁸ which recommends that Bulgaria make publicly available, on the national registry website, the up-to-date information in relation to each account number in that registry, each project identifier, holding and transaction information as listed in paragraphs 44–48 of the annex to decision 13/CMP.1. The ERT therefore reiterates the recommendation that the Party make

⁶ FCCC/ARR/2010/BGR, available at <http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5270.php>.

⁷ Ordinance by the Council of Ministers on the way and order of the organization of the national inventories of hazardous substances from greenhouse gases in the ambient air, according to Ordinance No. 215/21.09.2010 by the Council of the Ministers (published in State Gazette No. 76/2010), available at <<http://dv.parliament.bg/DVWeb/broevList.faces>>.

⁸ IAR/2009/BRG/1/1, IAR/2009/BRG/2/1, available at <http://unfccc.int/kyoto_protocol/registry_systems/independent_assessment_reports/items/4061.php>.

available, on the national registry website, public information in line with the requirements of the annex to decision 13/CMP.1.

28. The ERT concluded that Bulgaria'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

29. As required by the UNFCCC reporting guidelines, Bulgaria has provided in its NC5 comprehensive information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol. The Party provided textual descriptions of the PaMs for most of the sectors and subdivided by gas: CO₂, CH₄ and N₂O. Each reported sector has its own textual description of the principal PaMs, supplemented by a summary table on the PaMs organized by sector. The Party has also provided information on how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals, consistent with the objective of the Convention. The NC5 contains a comparable set of PaMs with those contained in the fourth national communication (NC4) and does not generally expand on the information provided in the NC4.

30. However, the ERT noted that Bulgaria did not provide some of the reporting elements required by the UNFCCC reporting guidelines. The textual description of the principal PaMs adopted to implement the Party's commitments under Article 4, paragraph 2(a) and (b), of the Convention by sector, as set out in section D of the UNFCCC reporting guidelines, does not contain information on the PaMs in the industrial processes and LULUCF sectors and the PaMs aimed at reducing HFCs, PFCs and SF₆ (F-gases). However, during the review, Bulgaria provided missing information, except for the PaMs aimed at reducing PFCs, as it explained that these emissions do not occur in the country since 2005. Therefore, the ERT recommends that Bulgaria include, in its next national communication, information on PaMs in the industrial processes and LULUCF sectors and PaMs aimed at reducing F-gases, as relevant, in order to improve the completeness of its reporting.

31. In its NC5, Bulgaria has provided limited information on the costs of its PaMs and their benefits (including co-benefits) and the fiscal impacts of each PaM or set of PaMs. The ERT noted that such information and assessment would provide useful insights for the further improvement and development of new and effective PaMs. Further, information relating to the non-GHG mitigation benefits of PaMs was not included. The Party's NC5 does not identify the PaMs that could potentially lead, directly or indirectly, to an increase in GHG emissions. The ERT encourages Bulgaria to identify PaMs leading to an increase in GHG emissions.

32. The ERT noted that the reported information on individual PaMs and the summary table on PaMs organized by sector and subdivided by GHG were not sufficiently transparent. The ERT recommends that Bulgaria improve the transparency of its reporting by providing information on PaMs subdivided by GHG in a more structured way by reporting the objectives of the PaMs, the status of their implementation, the implementing entity and the type of PaM.

33. The NC5 does not provide the aggregated mitigation effects of PaMs in each sector. However, information on the estimated mitigation effects of each individual PaMs and of PaMs in each sector was provided by the Party during the review. Bulgaria also informed

the ERT, during the review, about its approach to monitor the progress in implementation of the PaMs on an annual basis. However, the Party did not explain the potential synergies and/or overlaps among the PaMs at either the national or the regional level. The ERT encourages Bulgaria to provide more detailed and transparent information based on an analysis of the effectiveness of the PaMs as well as their synergies in quantitative and qualitative terms in its next national communication and on monitoring of effects of individual PaMs.

34. The NC5 provides an overview of a range of cross-sectoral policies at the national level. During the review, the Party provided additional information on its PaMs. As reported in the NC5, the important milestone of the overall strategy for climate change mitigation in Bulgaria was the Second NAPCC (2004) that listed activities for the period 2005–2009. During the review, the Party informed the ERT that the Third NAPCC for the period 2013–2020 is being finalized based on the findings of the recent internal assessment of the implementation of the Second NAPCC.

35. Energy policies dominate the regulatory climate change policy landscape; the key relevant legislation includes the Energy Act (2003), the Renewable Energy Source Act (2011) and the Energy Efficiency Act (2004), as well as the Environmental Protection Act (amended in 2010), the Clean Air Act (1996) and the Waste Management Act (2012).

36. The Party is on track to meet its Kyoto Protocol target of an 8 per cent emission reduction below the 1988 (base year) level during the first commitment period (see para. 86 below).

37. Since its accession to the EU in 2007, Bulgaria developed the policy framework to comply with the EU emission reduction targets and participates in the EU emissions trading scheme (EU ETS) with over 140 installations (see para. 41 below). The GHG emissions from the sectors not covered by the EU ETS, such as transport, housing, agriculture and waste, are regulated by the provisions of the EU effort-sharing decision,⁹ according to which, Bulgaria's emissions are allowed to increase by up to 20 per cent by 2020 compared to the 2005 level. However, the EU introduced a special provision for Bulgaria, under which 2007 is used as a base year as Bulgaria did not have the ETS in place in 2005. Table 3 provides a summary of the reported information on the PaMs of Bulgaria.

Table 3
Summary of information on policies and measures

<i>Major policies and measures</i>	<i>Examples/comments</i>
<i>Policy framework and cross-sectoral measures</i>	
Environmental Protection Act (amended in 2010)	The Act describes climate change mitigation policies, such as the European Union emissions trading scheme and the green investment scheme for climate change projects.
Second National Action Plan on Climate Change for 2005–2009 (2004)	The Action Plan contains a comprehensive set of actions addressing the climate change mitigation efforts.

⁹ Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020.

<i>Major policies and measures</i>	<i>Examples/comments</i>
<i>Policies and measures by sector</i>	
<i>Energy</i>	
Energy supply	<p>The Energy Act (2003) regulates production, trade, transmission and distribution of electricity; supply of heat and natural gas; energy sector development and energy security; development of energy market; and promotion of cogeneration of electricity and heat.</p> <p>Measures to improve energy supply include the upgrading of the units of the existing nuclear power plant (Kozloduy) and the introduction of more efficient fuel utilization processes that will result in higher electricity production, which will reduce fossil fuel consumption from conventional power plants. Estimated effect of improvement of operations of Kozloduy nuclear power plant is 946 Gg CO₂ eq in 2010 and 1,000 Gg CO₂ eq in 2020.</p> <p>The Energy Strategy 2020 (2011) is aimed at ensuring the security of energy supply; achievement of the targets for renewable energy sources (RES); increasing energy efficiency; and establishing the competitive energy market and effective energy policy. Estimated effect of some measures such as decrease in losses in heat transmission and distribution networks, upgrading of cogeneration plants and district heating systems is 2,120 Gg CO₂ eq in 2010 and 2,950 Gg CO₂ eq in 2020.</p>
Renewable energy	<p>The National Long-term Programme for the Support of RES Utilization for 2005–2015 (2004) is aimed at the increase of the share of non-hydropower RES in the energy mix, to achieve a 6 per cent share of RES in the national energy balance by 2015 and to increase the share of electricity produced from RES to 9 per cent or more of gross electricity generation in 2015. Estimated effect of some measures such as construction of small and micro hydropower plants and the use of biomass for electricity and heat production is 250 Gg CO₂ eq in 2010 and 830 Gg CO₂ eq in 2020.</p> <p>The National Long-term Programme for Promotion of Biomass Use for 2008–2020 (2007) promotes the use of biomass that has the highest technically available potential for renewable energy generation. The implementation of the national targets for RES and the production of electricity from RES will require the use of biomass in all its forms in the forestry, agriculture and waste sectors.</p> <p>The Renewable and Alternative Energy Sources and Biofuels Act (2009) provides incentives for the use of RES for electricity production, such as obligatory connection to the transmission or distribution networks; payment only for the direct costs of network connection; long-term power purchase agreements; and obligatory purchase of the electricity produced from RES.</p> <p>The National Renewable Energy Action Plan 2020 (2010) estimates the total expected contribution of each technology for the production of energy from RES and energy efficiency in order to meet the 2020 targets, sets sectoral targets and defines support schemes to promote the use of RES.</p> <p>The Renewable Energy Sources Act (2011) regulates the production and consumption of electricity, heating and cooling from RES, mainly biomass.</p>
Energy efficiency	<p>The Energy Efficiency Act (2004) regulates the energy efficiency improvements and provision of energy efficient services and encourages energy efficiency through a system of national, regional and municipal measures.</p> <p>The National Long-term Energy Efficiency Programme for 2005–2015 (2005) and the National Short-term Energy Efficiency Programme for 2005–2007 (2005) are aimed at improvements in energy intensity and reduction in energy consumption.</p> <p>The Second National Energy Efficiency Action Plan for 2011–2013 (2011) sets the objective to increase annual energy and fuel savings to 6 per cent of the average value of final energy consumption in 2001–2005 by 2013. The action plan includes measures such as: preferential prices and obligatory purchasing of electricity from RES; incentives for energy production effectiveness; education programmes; credits to support energy system decentralization; individual targets for energy savings for the transmission and distribution companies; incentives for the effectiveness in electricity and heat transmission and distribution; investments in smart grid systems; and infrastructure improvements.</p> <p>The National Energy Efficiency Strategy 2020 (2011) places an emphasis on energy efficiency in residential and public buildings as well as in the transport and industry sectors.</p>
<i>Transport</i>	<p>The National Long-term Programme for the Promotion of the Use of Biofuels in the Transport Sector 2008–2020 (2007) promotes and regulates the use of biofuels in transport and the types of raw materials used for biofuel production, and identifies actions to achieve the national indicative target for 2020.</p>

<i>Major policies and measures</i>	<i>Examples/comments</i>
	<p>The Development of a Sustainable Transport System in Bulgaria 2020 (2007) (Section of the National Plan for Sustainable Development of Bulgaria) includes plans for the development of the railway infrastructure, freight and public transportation, the infrastructure for the intra-modal shift, and efficiency improvements.</p> <p>The Renewable and Alternative Energy Sources and Biofuels Act (2009) provides incentives for the use of biofuels, such as: compulsory blending of biofuels with mineral oil derivatives; a reduced excise duty for biofuel blends; and the elimination of excise duty for pure biofuels.</p>
<i>Industrial processes</i>	<p>The Clean Air Act (1996) regulates the technical standards for ambient air quality, the limitation of emissions, the rights and obligations of the state, municipal and other authorities with regard to the control, management and maintenance of air quality.</p>
<i>Agriculture</i>	<p>The Ordinance on the Terms and Conditions to Help Producers of Energy Crops (2007) regulates the provision of direct payments per ha for energy crops and establishes common rules for direct support schemes under the EU Common Agricultural Policy.</p> <p>The Programme on Limitation and Prevention of Nitrate Pollution from Agriculture Sources in Nitrate Pollution Vulnerable Zones for 2011–2014 (2011) contains specific requirements for the storage of nitrogen-containing fertilizers, manure storage and use in order to reduce related emissions to a minimum. Estimated effect is 20 Gg CO₂ eq in 2010 and 170 Gg CO₂ eq in 2020.</p>
<i>Forestry</i>	<p>The National Strategy for Sustainable Development of the Forest Sector for 2006–2015 (2006) focuses on sustainable management of forests and multifunctional forest management, including social and economic development, especially in rural areas. It introduces monitoring, evaluation and reporting instruments.</p> <p>The Strategic Plan for Development of the Forest Sector for 2007–2011 (2007) aims at maintaining valuable forest ecosystems while contributing to climate change mitigation.</p> <p>The Forestry Act (2011) regulates forest conservation, management and use of forest areas to ensure the versatile and sustainable management of forest ecosystems.</p>
<i>Waste</i>	<p>The National Waste Management Programme for 2009–2013 (2009) enforces an integrated and effective waste management system and provides a framework for local authorities to implement the national policy on a regional level, including waste prevention, separate waste collection and management of specific waste streams. The programme introduces the Extended Producer Responsibility Principle that integrates environmental costs associated with products throughout their life cycles into the market price of the products.</p>

Note: The greenhouse gas reduction estimates, given for some measures, are reductions in carbon dioxide equivalent (CO₂ eq) for the years 2010 and 2020.

1. Policy framework and cross-sectoral measures

38. MoEW is the Government institution that is in charge of policies and activities on the protection of the environment and climate change in Bulgaria and is responsible for the submission of the NCs and the annual inventories of GHG emissions to the secretariat. The Executive Environment Agency, which functions within and reports to MoEW, compiles the national GHG inventory and also administers the associated national registry. The Inter-Ministerial Committee on Climate Change was set up in 2000 to coordinate the implementation of the First NAPCC. The Committee consists of representatives from most of the ministries and from Executive Environment Agency and an observer from the Sofia municipality, and is chaired by the Deputy Minister of MoEW. In addition, Bulgaria established the Steering Committee for Joint Implementation Projects and the Inter-ministerial Working Group for Development of the National Allocation Plan under the EU ETS.

39. According to the NC5, the municipalities play an important role in implementation of local climate policies, in particular in implementation of energy efficiency measures, such as refurbishment of residential and commercial buildings as well as introduction of energy-saving appliances in the public sector. During the review, Bulgaria provided further examples of the activities implemented by regional and local authorities. The ERT

encourages the Party to report on the role of regions and municipalities in climate change policy in more detail in its next national communication and include some examples of successful policy implementation at the local level.

40. Bulgaria has committed to implementing the EU Climate and Energy Package adopted in 2008, which set the so-called '20-20-20 targets' for 2020, such as the reduction of GHG emissions by 20 per cent below the 1990 level; the increase of the share of renewable energy sources (RES) to 20 per cent of gross final energy consumption; and the reduction of primary energy consumption by 20 per cent. The EU targets are translated into the national legislation and corresponding national targets and supported by several complementary EU directives transposed into the national legislation addressing specific sectors (see paras. 47, 52 and 58 below). The major implementation hurdle emphasized by Bulgaria is the slow down of its economic growth in the recent years and consequent lack of sufficient financial resources to support the policy implementation.

41. The key cross-sectoral climate change PaM is the EU ETS, which covers 59.6 per cent of total GHG emissions for the period 2008–2012. According to the Second National Allocation Plan, the total quantity of allowances for allocation in the period 2008–2012 is 298,458 million units. The country's aggregate total emissions for that period are projected at 508,339 Mt CO₂ eq.

2. Policies and measures in the energy sector

42. Between the base year and 2009, GHG emissions from the energy sector decreased by 47.2 per cent (40.27 Tg CO₂ eq), mainly driven by , the restructuring of the economic activity due to the transition from a centrally-planned to a market-driven economy and the subsequent economic slowdown. The key driver for the fall in emissions was a sharp decrease in demand for electricity production from thermal power plants. The trend of GHG emissions between 1988 and 2009 was defined by a substantial decrease in emissions from fuel combustion in energy industries (26.3 per cent), and energy use in manufacturing industry and construction (82.2 per cent) and in other sectors (87.5 per cent), as well as a clear increase in GHG emissions from transport (13.4 per cent).

43. **Energy supply.** Bulgaria's energy sector is characterized by high dependency on imported energy sources (about 70 per cent of its primary energy resources were imported in 2008, mainly from Russia). The key priority of Bulgaria's energy policy is to ensure its energy supply security through the diversification of energy imports and exports, decrease in energy intensity, promotion of RES and energy efficiency. Despite improvements in energy efficiency in recent years, Bulgaria remains one of the most energy- and carbon-intensive EU economies.¹⁰ The energy sector is dominated by local lignite-fired and nuclear power production, with 38.1 per cent of electricity and heat produced by lignite-fired power plants and 32.6 per cent by nuclear power plants in 2008. The share of nuclear energy in electricity generation is projected to grow from 15.2 per cent in 2010 to 30 per cent in 2030 due to extension of the service life of units 5 and 6 of the Kozloduy nuclear power plant and construction of new nuclear capacity equal to 2000 MW. At its only nuclear power plant in Kozloduy, the Party is currently implementing an upgrade programme which aims to reduce planned demurrage and fuel recharge.

44. The Party informed the ERT that the demand for electricity in Bulgaria is forecast to increase by 8 per cent and 23 per cent in 2020 and 2030, respectively, relative to 2005. This increase is to be accompanied by a parallel increase in domestic power production by 13 per cent in 2020 and 32 per cent in 2030. Currently, domestic power production fully

¹⁰ In 2010, out of EU 27, Bulgaria was ranked the first in terms of energy intensity with 853 k toe/1000 EUR, according to Eurostat data that is available at <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tsien020>.

covers the national demand, and it is forecast to reach a level of 10.4 TWh in 2020 and 13 TWh in 2030. The surplus power produced is planned to be exported. The projected rise in power production is expected to result mainly in an increase in the share of renewables and nuclear energy in power production.

45. **Renewable energy sources.** In its NC5, Bulgaria reported limited information on the PaMs to promote the RES. It reported that due to the lack of support mechanisms in the last years, RES in Bulgaria were not sufficiently developed despite the fact that the potential of biomass, wind and geothermal energy is relatively high. However, during the review, Bulgaria reported on the National Long-term Programme for the Support of RES Utilization for 2005–2015 (2004) aimed to achieve a 6 per cent share of RES (excluding hydro power) in the national energy balance by 2015; to increase the share of electricity produced from RES to 9 per cent or more of gross electricity generation in 2015; and to increase the share of non-hydropower RES in the energy mix.

46. During the review, the ERT learned that the Renewable and Alternative Energy Sources and Biofuels Act (2009) was adopted to encourage electricity generation from RES, alternative sources and biofuels. The Renewable Energy Sources Act (2011) transposed the requirements of the EU Renewable Energy Directive (2009/28/EC). This Act improves the regulatory framework to promote RES, establishes a mechanism for achieving a balance between the responsibilities of investors and those of the owners of electricity networks, and provides incentives for energy production for heating and cooling. The Renewable Energy Sources Act provides for the modernization of production processes to combine energy efficiency measures with measures on the use of RES for heating and cooling to satisfy the technological needs of the enterprises. Bulgaria informed the ERT that it had adopted the National Long-term Programme for Promotion of Biomass Use for 2008–2020 (2007) to promote the use of biomass.

47. Under the EU Climate and Energy package, Bulgaria's target is to increase the share of RES to 16 per cent in the gross final energy consumption by 2020. The national sectoral targets are to reach a 20.8 per cent share of RES in electricity, a 23.8 per cent share of RES in heating and cooling and a 10.8 per cent share of RES in transport. These targets will be reached through the implementation of the Energy Strategy 2020 (2003) and the National Renewable Energy Action Plan 2020 (2010), which provides the estimates of the total expected contribution of each technology in production of energy from RES and energy efficiency in order to meet the 2020 targets, sets sectoral targets and defines support schemes to promote the use of RES.

48. During the review, the ERT learned that according to the first national report on Bulgaria's progress in promoting and using renewable energy, the share of RES in gross final energy consumption in 2010 was 12.6 per cent. The share of energy from RES used for electricity was reported to be 12 per cent (384 ktoe), for heating and cooling 20.1 per cent (923 ktoe) and for transport 0.6 per cent (14 ktoe). In 2010, Bulgaria achieved a share of energy production from RES of 12.4 per cent, which is equal to the share that Bulgaria planned to achieve in 2015–2016. The Party was of the view that the 2020 RES targets may not be difficult to achieve.

49. During the review, Bulgaria further informed the ERT that, in 2010, its RES-based electricity generation was equal to 5.6 TWh and it expects to increase it to 5.8 TWh by 2020. Electricity from RES is mainly promoted through feed-in tariffs introduced in 2007. The effective implementation of feed-in tariffs supported by non-discriminatory access to the power grid and simplified licensing procedures will be the basis for a market uptake of RES in the country. The support for the use of RES for heating and cooling is provided through the International Fund 'Kozloduy' (IFK), which was established by the European Bank for Reconstruction and Development (EBRD) and Bulgaria in 2002. According to the agreement, the EBRD is the administrator of the funds and the Ministry of Economy,

Energy and Tourism is responsible for the implementation work. The IFK was created to manage the EU grant to reduce the effects of the early decommissioning of units 1–4 of the Kozloduy nuclear power plant. It finances measures to support the necessary restructuring, modernization and rehabilitation of the energy production, transmission and distribution systems, as well as improvements in energy efficiency.

50. *Energy efficiency.* During the review, the Party informed the ERT that the main policy document promoting energy efficiency is the Energy Strategy 2020 (2011). However, already prior to 2011, Bulgaria had established a comprehensive policy framework regulating the energy efficiency activities across all sectors of economy. In 2005, Bulgaria adopted the National Short-term Energy Efficiency Programme for the period 2005–2007 (2005), which resulted in a 1.5 per cent reduction in final energy consumption and in an emission reduction of 0.6 Mt CO₂ eq in 2006.

51. Further, Bulgaria adopted the National Long-term Energy Efficiency Programme for the period 2005–2015 (2005) aimed at achieving a reduction by 8 per cent in energy intensity of economy, measured through GDP, by 2015, promoting energy efficiency across all sectors of the economy and increasing the competitiveness of the national economy. However, the ERT was informed that in 2010, the programme was discontinued due to the introduction of the requirement for EU member States to prepare the National Action Plans on Energy Efficiency, based on the EU Directive on Energy End-Use and Energy Services (2006/32/EC), and the respective functions of the Executive Energy Agency were brought to an end.

52. During the period 2006–2008, Bulgaria introduced measures to encourage small and medium enterprises to reduce energy consumption through a grant scheme, which supports the technology upgrading, building refurbishing and modernization. Financial incentives for energy efficiency measures were promoted through the Energy Efficiency Fund, specialized credit lines, financing under the EU funds and programmes, and the creation of additional schemes and instruments, including those developed for the implementation of the National Programme of Residential Buildings Refurbishment (2004) (see para. 55 below). The Energy Efficiency Fund was capitalized, to some extent, by the revenue from the auctioning of carbon credits and it financed energy efficiency measures as well as other associated measures, such as the promotion of RES.

53. Bulgaria reported, during the review week, that the IFK, through its credit lines for energy efficiency for households and industry, finances loans and grants on energy efficiency and RES promotion, supporting end-use energy consumers through a network of partner banks. According to the reported statistics, by the end of 2010, EUR 50 million were allocated for household projects, which resulted in an electricity saving equal to 136,300 MWh/year and emission reductions equal to 182,000 t CO₂ eq. In 2011, EUR 110.82 million were allocated for projects in industry, which resulted in emission reductions of over 674,000 t CO₂ eq.

54. During the review, Bulgaria informed the ERT that in order to reach the EU target of increasing energy savings by 2016 by 9 per cent of average final energy consumption for the period 2001–2005, it implemented the First National Energy Efficiency Action Plan (NEEAP) for the period 2008–2010 (2007), which included legal, financial, organizational and taxation measures for transport, agriculture, services and industry. According to the information provided by the Party during the review, the plan achieved emission savings of about 2 Mt CO₂ eq during the period 2008–2010 and over-achieved the intermediate target of 3.0 per cent for 2010 by 3.3 per cent by increasing energy savings to 5,168 TWh from the planned savings of 2,430 TWh.

55. In 2011, Bulgaria adopted the Second NEEAP for the period 2011–2013 (2011), which includes 58 high-priority activities aimed at achieving the 2020 target for energy

savings. The Party anticipates that the Second NEEAP will over-achieve the 2016 target of 9 per cent savings (7,291 TWh) by reaching savings of 16.3 per cent (13,693 TWh) mainly due to existing large energy savings potential and financial incentives to fully utilize this potential that were introduced through the existing legal framework.

56. During the review, Bulgaria further informed the ERT that it had adopted the National Energy Efficiency Strategy 2020 (2011) with a focus on measures in the residential sector, public buildings, transport and industry. The strategy also introduced the requirement to prepare a description of energy characteristics of buildings, incentives for energy services market creation and accelerated adoption of market mechanisms for further promotion of energy efficiency. The National Energy Efficiency Strategy is being updated by the inter-ministerial working group in order to reflect the provisions of the Energy Strategy 2020. It aims to develop and implement a comprehensive national policy for energy efficiency, encompassing all areas of society, with the emphasis on increasing the energy comfort of the population and on protection of the environment.

57. **Residential and commercial sectors.** During the review, Bulgaria explained that the Energy Efficiency Agency introduced the National Programme for Renovation of Residential Buildings the period 2006–2020 (2005) targeting the buildings sector through such activities as energy audits for public and municipal buildings. Over its implementation period, Bulgaria achieved total energy savings after the implementation of energy efficiency measures of 490.4 GWh and emission savings of 222.9 kt CO₂ eq, and a building area of about 5 million m² was covered by the programme.

58. During the review, the Party informed the ERT that it aims to expand the natural gas infrastructure network, which will replace coal currently used by households. With the support of EU funding, the established Gas Supply Programme intends to supply natural gas to 290,000 households and effectively reduce emissions by 2.3 Mt CO₂ eq. Currently, only 3 per cent of the population has access to the natural gas network and Bulgaria aims to increase this indicator to 30 per cent by 2020.

59. **Transport sector.** In its NC5, Bulgaria has reported that there were no any significant measures implemented in the transport sector. Among the planned measures, Bulgaria reported on modernization of railways, improvements in public transportation systems in cities and introduction of biofuels. During the review, the Party stated that since joining the EU, the efforts have been made to upgrade its legal and institutional framework regulating the transport sector to bring it in accordance with the international standards. The Party expressed its concern that the continued liberalization of the economy and improvements in the quality of life may lead to an increase in the use of cars and consequent increase in GHG emissions.

60. During the review, Bulgaria provided information on the National Long-term Programme for the Promotion of the Use of Biofuels for 2008–2020 (2007) and the Renewable and Alternative Energy Sources and Biofuels Act (2009) that were introduced to achieve the national indicative target of a 5.75 per cent share of biofuels in petrol and diesel fuel consumption in the transport sector for 2010. This target is consistent with the EU target of a minimum 10 per cent share of biofuels in total fuel use in transport by 2020. The programme promotes the use of biofuels in transport and regulates the types of raw materials used for biofuel production; according to the programme, Bulgaria is expected to achieve its indicative target for 2020. Complementary to the programme is the Act on Excise Duties that regulates excise duty on biodiesel and bioethanol to allow the wider use of biofuels.

61. In its NC5, Bulgaria reported some limited information on the identification of the steps taken to promote and/or implement any decisions by the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) in order to limit

or reduce GHG emissions not included in the Montreal Protocol from aviation and marine bunker fuels. As the EU member State, Bulgaria adheres to the EU position with regard to the IMO and takes part in the activities such as studies on emission reduction options, including emission-differentiated port fees, emission standards, levies and emission trading. Bulgaria also supports the ICAO activities aimed at development of the CO₂-based technical standards and inclusion of the aviation sector in the EU ETS.

62. **Industrial sector.** Between 1988 and 2009, GHG emissions from the industrial sector decreased by 26.3 per cent (10.6 Tg CO₂ eq). The Party targeted energy efficiency as one of its main priorities in order to reduce sectoral emissions. In the NC5, Bulgaria reported some limited information related to the activities implemented under the EU Directive on Integrated Pollution Prevention and Control and the EU ETS. Bulgaria reported on such measures as reduction of losses in heat transmission and distribution networks through technological upgrading of the insulation in high-pressure and high-temperature installations and replacing heat exchangers in the industrial enterprises.

3. Policies and measures in other sectors

63. Between 1988 and 2009, GHG emissions from the industrial processes (including solvent and other product use), agriculture and waste sectors decreased by 62.4 per cent (23.87 Tg CO₂ eq), mainly driven by the consequences of the economic transformation which led to a contraction of economy and a decreasing population. The trend in GHG emissions from all non-energy sectors showed notable decreases, with the industrial processes and agriculture sectors experiencing the greatest reductions.

64. **Industrial processes.** Between 1988 and 2009, GHG emissions from the industrial processes sector decreased by 72.3 per cent (8.96 Tg CO₂ eq). Emissions from industrial processes accounted for 5.8 per cent of total GHG emissions in Bulgaria in 2009. Emission reductions were mainly driven by the restructuring of the sector as part of the economic transition process. In its NC5, Bulgaria has not reported any information on the PaMs in the industrial processes sector. During the review, Bulgaria informed the ERT that similar to other EU member States, it implements the EU Integrated Pollution Prevention and Control Directive and is included in the EU ETS that is considered to be one of Bulgaria's main measures in the industrial sector.

65. **Agriculture.** Between 1988 and 2009, GHG emissions from the agriculture sector decreased by 67.5 per cent (12.83 Tg CO₂ eq). The sector represented 10.4 per cent of total GHG emissions in 2009. The emission reductions were mainly driven by the systematic declines in the agricultural land area due to abandoning of arable lands and reduction in livestock population. Another driver for the emission reduction was the decline in the use of fertilizers.

66. The ERT noted that the NC5 provided limited information on the planned PaMs, and no information on any currently implemented PaMs in the agriculture sector. The Party indicated during the review its intention to implement such additional measures as manure treatment and rational use of fertilization and irrigation practices.

67. **LULUCF.** The LULUCF sector in Bulgaria was a net sink of 11.78 Tg CO₂ eq in 2009. Since 1988, the net GHG removals decreased by 2.36 Tg CO₂ eq or by 16.7 per cent. In 2009, the LULUCF sector was responsible for emission removals amounting to 19.8 per cent of total GHG emissions.

68. In its NC5, Bulgaria did not include any information on the PaMs in the LULUCF sector. However, during the review, Bulgaria informed the ERT that the National Forest Policy and Strategy on Sustainable Forest Development for the period 2003–2013 was adopted in 2003 and revised in 2006 for the period 2006–2015. This strategy is a good example of a document, establishing a framework for sustainable development and serves

as a basis for identification of activities, funded by the grant scheme. The National Strategy is complemented by the Strategic Plan of Action for Forest Sector Development for the period 2007–2011 (2007), which describes five-year sectoral funding requirements and establishes milestones for implementation.

69. All forest-related issues are regulated by the Forestry Act (2011)¹¹ which aims to secure that forest management activities related to wood production ensure the sustainable use of natural resources and the safeguarding of other relevant forest functions, such as biodiversity conservation.

70. Bulgaria informed the ERT that during the period 1993–2003 the Party has expanded its forested area through afforestation by 3.5 per cent. From 1988 to 2008, the Party reduced the total bare forest area by 37.4 per cent, from 98,350 ha to 61,562 ha. Afforestation practices are regulated by law, yet no detailed data were made available for the recent period of the end of 2000s. The Party claims to have afforested an area of 1.5 million ha over the past 50 years.

71. **Waste management.** Between 1988 and 2009, GHG emissions from the waste sector decreased by 30.5 per cent (2.09 Tg CO₂ eq) representing 8.0 per cent of total GHG emissions in 2009. The above-mentioned decline was mainly driven by a steady population decline over the past 10 years.

72. In its NC5, Bulgaria reported on the municipal waste management policies and planned utilization of the captured methane for electricity production. During the review, the ERT was informed that Bulgaria recently adopted the national policies for the waste sector, such as the National Waste Management Programme for the period 2009–2013 (2009), the National Strategic Plan for Diversion of Biodegradable Waste Going to Landfills for the period 2010–2020 (2010), the National Strategic Plan on Sewage Sludge Management for the period 2012–2020 (under development) and the National Green Public Procurement Action Plan for the period 2012–2014. Bulgaria provided information that it takes part in the Global Methane Initiative to fight climate change while developing clean energy and stronger economies.

73. Further, Bulgaria provided the information that it transposed a number of the EU directives into the national legislation, such as the EU Directives on Waste, on Land filling and on Integrated Pollution Prevention and Control. According to the EU legislation, each member State will adopt the targets, by 2020, to prepare for re-use and recycling the household waste materials to a minimum of overall 50 per cent by weight, and non-hazardous construction and demolition waste to a minimum of 70 per cent by weight.

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

74. In its NC5, Bulgaria 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 Bulgaria strives to implement its commitments under Article 3, paragraph 1, of the Convention in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, as reported in the 2010 and 2011 annual submissions is presented in section II.I of this report.

75. The measures to minimize adverse effects reported in the NC5 are mostly associated with EU membership obligations and include the reduction and phasing out of: market imperfections; fiscal incentives; tax and duty exemptions; and subsidies in all GHG-

¹¹ State Gazette No. 19/8.03.2011, effective 9 April 2011, amended, State Gazette No. 43/7.06.2011.

emitting sectors. Those measures also include cooperation in development and transfer of knowledge that effectively helps to reduce emissions from currently used older technologies.

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

76. In its NC5, Bulgaria has provided a textual description of three emission projection scenarios: 'without measures', 'with measures' and 'with additional measures', and quantified information for two of these emission projection scenarios, namely 'with measures' and 'with additional measures'.

77. During the review, the Party provided the ERT with the updated projections prepared in 2011 and included in the Bulgarian national report under Article 3, paragraph 2, of decision 280/2004EC (EU Greenhouse Gas Monitoring Mechanism). These projections were based on the methodology used for projections reported in the NC5, but prepared using inventory data from the 2010 annual submission and updated assumptions. Further, during the review, Bulgaria provided the ERT with the updated projections prepared in 2012, which included revised assumptions. Bulgaria informed the ERT that it plans to prepare the further updated projections later in 2012. In this report, the ERT analysed the NC5 and the latest updated projections from 2012.

1. Projections overview, methodology and key assumptions

78. The GHG emission projections reported by Bulgaria in the NC5 include a textual description and quantitative information for the 'with measures' and 'with additional measures' scenarios for the period 2005–2020, presented relative to actual inventory data up to 2008. The projected emissions are reported on a gas-by-gas basis for the following GHGs: CO₂, CH₄ and N₂O. The projections are prepared on a sectoral basis, but the sectoral categories used are different from the ones used in the section on PaMs (see para. 80 below). The projections are also provided in an aggregated format for most sectors as well as for a national total, using global warming potential values. The emission projections related to fuel sold to ships and aircraft engaged in international transport are not included in the totals and were not reported separately.

79. However, the ERT noted that Bulgaria did not provide the following reporting elements required by the UNFCCC reporting guidelines: projections presented on a gas-by-gas basis for PFCs, HFCs and SF₆ (treating PFCs and HFCs collectively in each case); projections for the LULUCF and the solvent and other product use sectors; and projections presented together with actual data for the base year (1988) in accordance with Article 4, paragraph 6, of the Convention. However, during the review, the Party provided the ERT with almost all missing reporting elements, except for the projections of PFCs, explaining that PFCs are not occurring in Bulgaria since 2005 (2005 being a base year for F-gasses). The ERT recommends that Bulgaria provide, in its next national communication, all mandatory reporting elements. The ERT encourages Bulgaria to report in its next national communication the projections together with actual inventory data for the period starting with 1988 up to the latest available year.

80. The ERT noted that the Party has not provided projections of non-methane volatile organic compounds (NMVOCs) and sulphur dioxide (SO₂). The ERT therefore encourages Bulgaria, to the extent possible, to include this information in its next national communication.

81. During the review, Bulgaria provided to the ERT the projections prepared in 2012 relative to emission trends for the period 1988–2009. However, the ERT noted that

inventory data presented in the most recent projections differ significantly from the inventory data reported in the 2011 annual submission; therefore Bulgaria should calibrate these projections to be in line with the most recent available GHG inventory. The ERT recommends that Bulgaria report relevant information on factors and activities affecting the emission trends for each sector.

82. In its NC5, Bulgaria has reported the textual description only for the ‘without measures’ scenario, which is referred to as the ‘frozen efficiency’ or ‘business as usual’ scenario. However, the Party has not included quantitative emission projections for this scenario. In the NC5, the definition of the ‘with measures’ and ‘with additional measures’ scenarios has not been transparently described. During the review, Bulgaria provided the ERT with additional information on the description of the scenarios, including information on the reference year since which the effects of the PaMs are included in the ‘with measures’ and ‘with additional measures’ scenarios. During the review, it was clarified that the ‘with measures’ scenario encompasses the PaMs implemented and adopted before 2007, but Bulgaria did not report any PaMs for the transport, agriculture and waste sectors in this scenario. The ‘with additional measures’ scenario comprises the PaMs planned after 2007 and encompasses the PaMs in the energy, transport, industrial, agriculture, residential/commercial and waste sectors. The ERT encourages Bulgaria to report the definitions of the projection scenarios, assumptions and key variables used for preparation of the projections in its next national communication.

83. The projections were presented on a sectoral basis, but the residential and commercial/institutional buildings sector used in the section of the NC5 on PaMs was missing in the section on projections. The services and financial sector was mentioned only in the section on projections but not in the section on PaMs. The ERT recommends that Bulgaria report, in its next national communication, the emission projections using, to the extent possible, the same sectoral categories as those used in the section on PaMs.

84. According to the NC5, the projected GHG emissions in 2010 are below the 1990 level by 35.3 per cent and 39.3 per cent under the ‘with measures’ and ‘with additional measures’ scenarios, respectively. However, the emission trend shows a significant increase in total GHG emissions from 2005 to 2020, that is expected to result in emission levels in 2020 about 5.0 per cent and 16.1 per cent below 1990 levels according to the ‘with measures’ and ‘with additional measures’ scenarios, respectively. The main emission drivers are the expected significant increase in GDP and gross electricity demand between 2005 and 2020. Despite these factors, the effect of additional PaMs is expected to moderate the projected emission growth. Nevertheless, the emissions after 2010 are expected to follow the upward trend in contrast with most other EU member States.

85. The methodology used in the NC5 is the same as the one used in all previous national communications of Bulgaria. It is based on the ENPEP package, a non-linear equilibrium approach to determine the energy supply and demand balance, with the programme modules used for macroeconomic projections (MACRO), final energy demand forecast by sectors (DEMAND), the non-linear equilibrium model for the supply/demand balance (BALANCE), the calculation of electricity demand at least cost (WASP), and the module to determine the impacts of air and water pollution from energy-related activities (IMPACTS). The projections for the transport sector are based on the GDP forecast, implemented measures and statistics on the number of cars and vehicle-km based on average fuel consumption. Some elements of the COPERT model were also used. The projections for the agriculture sector are based on the projections of gross value added (GVA) used as a key driver, and the projections for the waste sector are based on projections of population growth and data on solid waste disposal used as key drivers. The main differences between the projections reported in the NC5 and those reported in the NC4 are the use of the most recent macroeconomic data in various sectors, the reflection of

the effects of the global economic crisis of 2008–2009, and the effects of the implementation of EU legislation following Bulgaria’s accession to the EU in 2007.

86. The main assumptions used in the projections reported in the NC5 are based on the economic indicators and their impact on the energy sector, such as the restructuring of the economy and the increased market share of the private sector; increased access to regional energy markets; a decrease in heavy industry; reductions in energy intensity; an increase in energy prices; and the enhancement of energy efficiency of both energy supply and demand. Additional assumptions used for the preparation of the projections are those related to GDP growth and population. The data on GDP were based on the 2007 data from the National Statistical Institute and the Energy Development Plan for the period 2008–2030. The data on population were based on the official projections prepared by the Academy of Sciences of Bulgaria.

87. According to the NC5, the ‘with measures’ scenario envisages a growth rate in electricity demand of 55 per cent for the period 2005–2020, while the ‘with additional measures’ scenario assumes a 68 per cent growth rate in electricity demand for the same period. There are also differences in the GDP and GVA projections used for both projection scenarios. The GDP and GVA used for the projections for the growth in the industrial sector are higher in the ‘with measures’ scenario than in the ‘with additional measures’ scenario. The ERT encourages Bulgaria to use the same data for the GDP growth and other variables for all projection scenarios. The sensitivity of the projections was assessed in relation to the level and composition of GDP, population, the level and structure of final energy consumption, and energy intensity.

2. Results of projections

88. Table 4 and the figure below show that Bulgaria will meet its Kyoto Protocol target, which is to achieve an 8 per cent emission reduction below the 1988 level for the first commitment period (2008–2012), relatively easily by domestic efforts alone. This target is equal to total GHG emissions of 114.55 Tg CO₂ eq on average per year during the period 2008–2012. According to the ‘with measures’ and ‘with additional measures’ scenarios reported in the NC5, total GHG emissions in 2010 are projected to amount to 72.07 Tg CO₂ eq and 67.60 Tg CO₂ eq, respectively, that is 42.1 per cent and 45.7 per cent below the base year level.

89. During the review, Bulgaria provided to the ERT the updated projections. According to these updated projections, total GHG emissions for 2010 are below the reported amounts in the NC5 and are projected to amount to 68.31 Tg CO₂ eq and 62.94 Tg CO₂ eq under the ‘with measures’ and ‘with additional measures’ scenarios, respectively, i.e. 45.1 per cent and 49.5 per cent below base year level, respectively. These amounts remain by far below the Kyoto Protocol target for Bulgaria.

Table 4
Summary of greenhouse gas emission projections for Bulgaria

	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	111.43	-10.5	-
Inventory data 2009 ^a	59.50	-52.2	-46.6
Kyoto Protocol base year ^b	124.51	-	11.8
Kyoto Protocol target ^b	114.55	-8.0	2.9
<i>NC5</i>			
'With measures' projections for 2010 ^c	72.07	-42.1	-35.3
'With additional measures' projections for 2010 ^c	67.60	-45.7	-39.3
'With measures' projections for 2020 ^c	105.83	-15.0	-5.0
'With additional measures' projections for 2020 ^c	93.51	-24.9	-16.1
<i>Updated projections</i>			
'With measures' projections for 2010	68.31	-45.1	-38.7
'With additional measures' projections for 2010	62.94	-49.5	-43.5
'With measures' projections for 2020	92.81	-25.5	-16.7
'With additional measures' projections for 2020	83.41	-33.0	-25.1

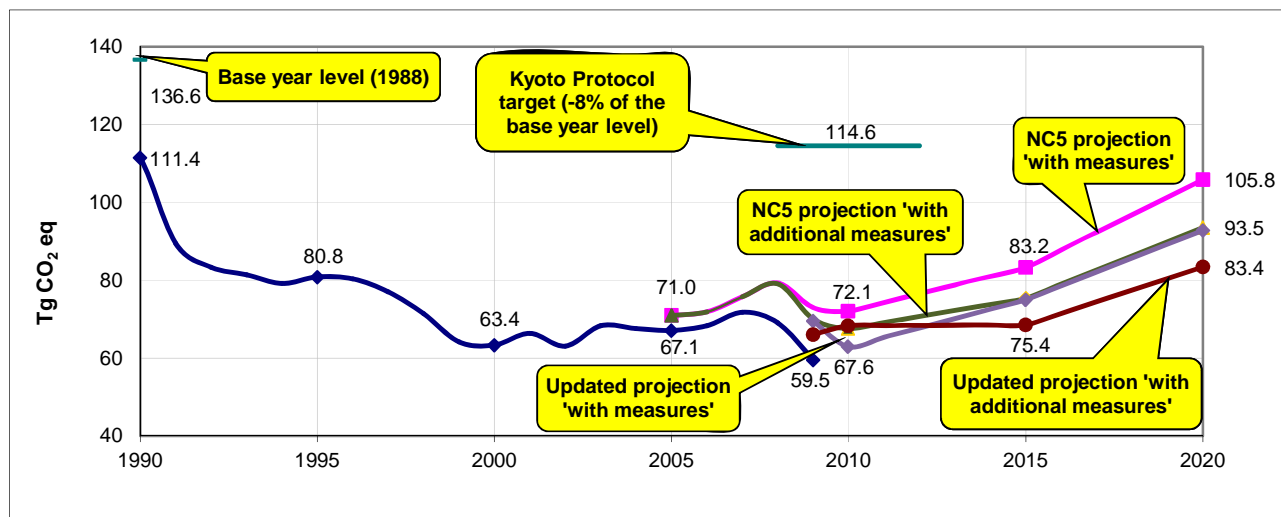
Data sources:

^a Bulgaria's 2011 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry.

^b Based on the initial review report of Bulgaria contained in document FCCC/IRR/2007/BGR; Bulgaria's base year is 1988.

^c Bulgaria's fifth national communication.

Greenhouse gas emission projections



Sources: (1) Data for the years 1988–2009: Bulgaria's 2011 greenhouse gas inventory submission; the emissions are without land use, land-use change and forestry (LULUCF). (2) Data for the years 2008–2020: Bulgaria's fifth national communication and projections updated based on 2010 annual submission; the emissions are without LULUCF.

Abbreviation: NC5 = fifth national communication.

90. According to the projections by gas reported in the NC5, GHG emissions are expected to increase under the 'with measures' and 'with additional measures' scenarios

during the period 2005–2020, namely CO₂ emissions are projected to increase by 46.0 per cent and 32.6 per cent; CH₄ emissions are projected to increase by 57.2 per cent and 25.5 per cent; and N₂O emissions by 70.5 per cent and 43.8 per cent, respectively.

91. In the updated projections, the projections by gas were provided for the period 1988–2020. In comparison with the projections reported in the NC5, the updated projections under the ‘with measures’ scenario also demonstrate an increase in emission levels during the period 2005–2020, but with the lower rate of growth, namely CO₂ emissions are projected to increase by 37.0 per cent, CH₄ emissions to increase by 54.3 per cent; and N₂O projections by 69.4 per cent. HFC and SF₆ emissions are projected to increase, by 22.5 per cent and 6.8 per cent, respectively, over the period 2005–2020 under the ‘with measures’ scenario.

92. The NC5 presented sectoral projections under the ‘with measures’ and ‘with additional measures’ scenarios for the period 2005–2020 for the following sectors: energy, industry, transport, services, finance, agriculture and waste. The highest growth in emissions is projected for the energy, agriculture and waste sectors. Under the ‘with measures’ scenario, during the period 2005–2020 emissions from the energy sector are expected to increase by 47.7 per cent, from the agriculture sector by 74.7 per cent and from the waste sector by 55.7 per cent.

93. During the review, Bulgaria provided the updated projections by sector for all sectors for the period 2005–2020. Under the ‘with measures’ scenario, emissions from the energy sector are projected to increase by 54.4 per cent during the period 2005–2020; while emissions from the agriculture sector are projected to increase by 73.3 per cent during the same period. Under the same scenario, emissions from the waste sector are projected to decrease by 45.2 per cent over the same period.

94. Bulgaria may see a growth in emissions by 2020, but the GHG emissions are not expected to exceed the Kyoto Protocol target even by 2020, as according to the updated projections, the emissions are projected to be 25.5 per cent and 33.0 per cent below the base year level by 2020, under the ‘with measures’ and ‘with additional measures’ scenarios, respectively. According to the updated projections, under the ‘with measures’ and ‘with additional measures’ scenarios, the emissions are projected to increase during the period 2005–2020 by 30.7 per cent and 17.4 per cent, respectively. The ERT noted that according to the ‘with measures’ scenario, Bulgaria may need to implement further measures in order to slow down emission growth by 2020 to meet its long-term target under the EU Climate and Energy package that is to limit the growth of emissions by 20 per cent above the 2005 level by 2020. Meeting its 2020 target for non-ETS sectors appears challenging for Bulgaria under the ‘with measures’ scenario.

95. The main drivers for emission growth between 2005 and 2020 are an increase in economic output measured by GDP and the resulting growth in gross electricity demand. This rise is expected to increase domestic consumption with the resulting increase in municipal waste production and thus emission growth in the waste sector. Bulgaria also expects a significant rise in animal production by 2020. The ERT encourages Bulgaria to reconsider the assumptions that underpin the rates of GHG emission growth used for the projections (a GDP growth rate of 2.5 per cent for the ‘with measures’ scenario).

3. Total effect of policies and measures

96. In its NC5, Bulgaria has not reported the estimated and expected total effect of implemented and adopted PaMs. However, this information was presented during the review in terms of emissions avoided or sequestered on a CO₂ eq basis for each sector for the years 2005, 2010, 2015 and 2020. The ERT noted that Bulgaria did not provide

information on the effects of PaMs in 1990, 1995 and 2000, explaining that, during this time, no significant climate change PaMs were implemented.

97. Bulgaria informed the ERT during the review that the total effect of implemented and adopted PaMs is 3.53 Tg CO₂ eq in 2010 and 6.27 Tg CO₂ eq in 2020, while the total effect of planned PaMs is 0.54 Tg CO₂ eq in 2010 and 2.80 Tg CO₂ eq in 2020 (see table 5 below). The ERT recommends that Bulgaria, in its next national communication, report information on the total estimated and expected effect of PaMs and include an explanation of how possible overlaps or synergies between different PaMs is taken into account to improve the completeness of its reporting. Table 5 provides an overview of the total effect of PaMs as reported by Bulgaria.

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

Sector	2010				2020			
	<i>Effect of implemented and adopted measures (Tg CO₂ eq)</i>	<i>Relative value (% of 1990 emissions)</i>	<i>Effect of planned measures (Tg CO₂ eq)</i>	<i>Relative value (% of 1990 emissions)</i>	<i>Effect of implemented and adopted measures (Tg CO₂ eq)</i>	<i>Relative value (% of 1990 emissions)</i>	<i>Effect of planned measures (Tg CO₂ eq)</i>	<i>Relative value (% of 1990 emissions)</i>
Energy (without CO ₂ from transport)	2.95	2.6	0.37	0.3	3.63	3.3	1.55	1.4
Transport – CO ₂	NA	NA	0.01	0.01	NA	NA	0.18	0.2
Industrial processes	0.08	0.1	0.12	0.1	0.14	0.1	0.68	0.6
Residential/Commercial buildings	0.50	0.5	0.01	0.01	2.50	2.2	0.06	0.1
Agriculture	NA	NA	0.03	0.03	NA	NA	0.24	0.2
Waste management	NA	NA	0.002	0.0	NA	NA	0.09	0.1
Total	3.53	3.2	0.54	0.5	6.27	5.6	2.80	2.5

Source: Information provided by Bulgaria during the review.

Note: The total effect of implemented and adopted policies and measures (PaMs) is defined as the sum of the individual PaMs included in the ‘with measures’ scenario in relevant sectors; the total effect of planned PaMs is defined as the sum of the individual PaMs included in the ‘with additional measures’ scenario in relevant sectors.

Abbreviation: NA = not available.

98. According to table 5, the PaMs implemented in the energy sector (without CO₂ from transport) are expected to deliver the largest emission reductions, followed by the PaMs implemented in the residential and commercial buildings sector. The total effect of implemented and adopted PaMs in the energy sector, without CO₂ from transport, is projected to increase between 2010 and 2020 by 23.1 per cent, from 2.95 Tg CO₂ eq to 3.63 Tg CO₂ eq, while the total effect of planned PaMs is projected to increase between 2010 and 2020 by 4.2 times, from 0.37 Tg CO₂ eq to 1.55 Tg CO₂ eq.

99. The biggest impact on emissions comes from the PaMs in energy supply, e.g. improvement in operation efficiency of the existing nuclear power plant, decreasing of losses in the distribution and transmission network or the use of biomass for electricity and heat production. The total effect of PaMs in the industrial processes and residential and commercial buildings sectors is projected to increase dramatically between 2010 and 2020 under both scenarios driven by implementation of monitoring systems for energy use in industry and insulation technology and building redesign (increase of heat transmission

efficiency). In the residential and commercial buildings sector, the increase of gas supply to households or the use of RES in public buildings will play an important role. However, successful implementation of mitigation measures is dependent on availability of financial resources.

4. Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol

100. In its NC5, Bulgaria has provided sufficient information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. Bulgaria has reported that it does not plan to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target for the first commitment period and that it will meet by far its Kyoto Protocol target by domestic efforts only.

101. Bulgaria informed the ERT that in accordance with the EU Linking Directive,¹² companies that are covered by the EU ETS can meet their emission reduction targets by reducing emissions and/or by acquiring emission allowances from the market. Bulgaria's companies can use up to 12.5 per cent¹³ of their total allowances (190,462,719 Tg CO₂ eq) for the period 2008–2012 or 4.76 Tg CO₂ eq per year.

102. The 2011 annual submission and the updated projections show that any possible revenue from the assigned amount units could be used for the purposes of the GIS. Bulgaria as an Annex I Party with an economy in transition receives financial and technological support within the framework of the projects under the joint implementation (JI) mechanism. According to the NC5, 27 JI projects have been approved and most of them have already started. It is expected that the projects will lead to an emission reduction of up to 8 Tg CO₂ eq during the period 2008–2012. This corresponds to approximately 1.2 per cent of Bulgaria's assigned amount for the period 2008–2012.

D. Vulnerability assessment, climate change impacts and adaptation measures

103. In its NC5, Bulgaria has provided the required information on the expected impacts of climate change in the country and on adaptation options. The sectors covered are agriculture, including water use for irrigation, soil management and forestry. However, the ERT noted that in its NC5, Bulgaria did not provide information on the expected impacts of climate change on human health, water resources, tourism and coastal areas, and only limited information was provided on the research conducted in the country on the assessment of climate change impacts on water.

104. During the review, the Party informed the ERT that in 2012 it plans to initiate a study on identification of vulnerable sectors of the economy, potential risks and measures for climate change adaptation. Based on the results of this study, Bulgaria also plans to prepare a National Adaptation Strategy in 2013. The ERT encourages Bulgaria to prepare the National Adaptation Strategy and to report on its experience with the preparation and implementation of the strategy in its next national communication. Table 6 summarizes the information on vulnerability and adaptation to climate change presented in the NC5.

¹² Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms.

¹³ Approved limit on the use of credits from JI and clean development mechanism (CDM) projects (per cent of allocation) according to the approved national allocation plan.

105. In its NC5, Bulgaria focused more on reporting on its vulnerability to climate change effects and adverse impacts than on concrete adaptation projects, programmes, activities or actions. However, there is a definite change in growing recognition of the importance of adaptation considerations, which was particularly apparent in the vulnerability and adaptation studies conducted and the pilot actions taken for that purpose.

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

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Agriculture and food security	<p><i>Vulnerability:</i> Droughts will increase in frequency and severity due to a decrease in precipitation. More frequent changes in climatic conditions will impact the growth of vegetation and the productivity of agriculture. Spring agricultural crops, crops cultivated on infertile soils, crops in non-irrigated areas and arable lands in the south-east of the country are expected to be the most severely impacted and exposed to the adverse impacts caused by the decrease in precipitation. The results of the case study on crops yields (north-east region) show that the effects of climate change can be positive for agriculture, resulting in an 11 to 23 per cent increase in crop yield and in a 2 to 4 per cent increase in the growth of the regional economy.</p> <p><i>Adaptation:</i> The actions are aimed at supporting and sustaining agricultural production and reducing the vulnerability of agricultural crops through technological innovations, changes in irrigation methods and the introduction of new cultivars and hybrids with higher productivity. The Party is planning to prepare an up-to-date strategy and a new programme on the rehabilitation and restructuring of irrigation management, and on improving the efficiency of the use of the existing irrigation infrastructure by reducing direct dependence on precipitation and water run-off and amending legislation in the irrigation sector.</p>
Forests	<p><i>Vulnerability:</i> Forests in Bulgaria are affected by chronic water deficit, drought, fires, floods, wind throws and insect disturbances (disease). The area of coniferous plantations has been decreasing since 1990 as a result of climate change impacts.</p> <p><i>Adaptation:</i> The most important adaptation measure involves the improvement and adaptation of the management of forest areas, particularly protected areas. Improvements in forest sequestration capacity will contribute to an increase in mitigation capacities.</p>
Soils	<p><i>Vulnerability:</i> Soils are sensitive to water decrease, wind erosion and drought effects. At least 30 per cent of soils are under threat.</p> <p><i>Adaptation:</i> Measures include the organization of studies and the collection of experience from pilot applications in order to improve soil management and control so as to gain an understanding of climate change impacts and adaptation to drought, precipitation deficits and wind erosion. The aim of the measures is to improve soil quality (texture and structure), in particular by avoiding, as appropriate, the use of chemical fertilizers and by adapting mechanical methods.</p>

106. The reported case studies show that Bulgaria is working towards putting in place the appropriate measures to increase its adaptation capacities, particularly in the agriculture sector. The Party does not have yet a specific adaptation strategy but it is implementing the strategic actions and activities under different national/sectoral plans and strategies, such as the Forest Management Plan and the Second NAPCC, as well as through the activities on the regional level implemented by the Ministry of Agriculture and Forestry. In its NC5, Bulgaria has not provided information on cooperation with Parties not included in Annex I to the Convention on preparation for adaptation. The ERT encourages Bulgaria to provide such information in its next national communication.

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

Provision of financial resources, including ‘new and additional’ resources and resources under Article 11 of the Kyoto Protocol

107. As a Party not included in Annex II, Bulgaria does not have to report on the implementation of Article 11 of the Kyoto Protocol, including on the provision of ‘new and additional’ financial resources and provision of fast-track funding.

108. In its NC5, Bulgaria provided limited information on actions implemented under Article 10 of the Convention, and during the review, Bulgaria provided more detailed information on several regional activities, aimed at building the capacity of neighbouring countries on measuring, reporting and verification of GHG emissions. Table 7 summarizes information on allocated financial resources.

Table 7
Summary of information on financial resources for 2008–2011

Channel of financial resources	Years of disbursement			
	2008	2009	2010	2011
Official development assistance, EUR million	12–17	12–17	31	3.5
Climate-related support programmes, EUR thousand				40

F. Research and systematic observation

109. In its NC5, Bulgaria has provided information on its actions relating to research and systematic observation, however, it does not reported on actions taken to support capacity building in developing country Parties, as per Article 10 of the Kyoto Protocol. During the review, Bulgaria informed the ERT that due to the existing financial constraints no activities have been implemented to facilitate implementation of Article 10 of the Kyoto Protocol.

110. Work on research and systematic observation in Bulgaria is coordinated by the national Scientific Coordination Centre for Global Change, established as an advisory body by the Bulgarian Academy of Sciences and carried out by the National Institute of Meteorology and Hydrology (NIMH). In addition to NIMH, which plays a key role in systematic observation, Bulgaria has three other scientific and technical institutions that participate in systematic observation: the Geophysical Institute–Academy L. Krastanov, the Institute of Oceanology and the Institute for Space Research.

111. With regard to Bulgaria’s participation in Global Climate Observing System (GCOS) activities, the situation since the NC4 has not changed: Bulgaria has one global atmospheric watch station (in Rojen) and does not yet have stations included in Global Surface Network (GSN) or Global Upper Air Network (GUAN). Bulgaria reported that the lack of financial support is still the main barrier to its participation in these networks. With regard to oceanographic observation, the Institute of Oceanology and the Bulgarian National Oceanographic Data Centre are putting in place a process for international data exchange and more active participation in the international networks. The ERT encourages the Party to further strengthen its participation in the GCOS network, particularly by establishing new GSN and GUAN stations.

112. Bulgaria's activities and initiatives benefit from national, bilateral and EU funding programmes, including the Sixth and Seventh Framework Programmes. Bulgaria reported that it welcomes the EU green paper entitled "European research area and new perspectives", which promotes regional climate change research activities and supports EU-wide cooperation projects among scientists and researchers. In its NC5, Bulgaria has provided information on its major projects, activities and publications, showing that there has been an increase in interest and in actions to tackle climate change in Bulgaria, as well as the greater involvement of Bulgarian research and educational institutions.

113. Bulgaria has not reported on its cooperation with developing countries on research and systematic observation activities, particularly support to developing countries in order to establish and maintain observing systems and related data and monitoring systems. The ERT recommends that Bulgaria report on its action taken to support related capacity-building in developing countries.

G. Education, training and public awareness

114. In its NC5, Bulgaria has provided information on its actions relating to education, training and public awareness at the national level only. The information provided in the relevant section of the NC5 is exactly the same as the information provided in the NC4. The information reported includes a self-assessment of the Party's capacity in the field of sustainable development, which indicates that one of its main capacity constraints is a general lack of interest among the public towards climate change issues, mainly due to a lack of information. The ERT noted that such problems may be resolved through the use of international and EU funds aimed at capacity-building and training to increase the number and improve the skills of Bulgarian experts.

115. During the review, Bulgaria informed the ERT about additional activities implemented in this area, such as: climate change related subjects introduced in some university curricula; the regular update of the MoEW website; the publication of brochures and other training material; the organization of workshops on JI and EU requirements for the use of EU funds for financing climate-friendly activities; ongoing activities by the Ministry of Agriculture and Forestry on the education and training of farmers on climate- and energy-friendly practices; two ongoing initiatives supported by international funds on raising public awareness on climate change and energy, implemented by local non-governmental organizations (NGOs); training activities on GHG emission inventories since 2010; and an ongoing programme on capacity-building for GHG emission inventories and registries in the former Yugoslav Republic of Macedonia. In its Third NAPCC, Bulgaria will ensure the inclusion of a number of measures on education. Further, the Party informed the ERT during the review that the process of preparing the NAPCC is inclusive and public, so the NAPCC itself is an instrument for raising public awareness on climate change and energy.

116. During the review, the ERT was informed that the national NGOs formed a Climate Coalition as a forum for interacting with governmental bodies on matters related to climate change and energy, and positive cooperation with MoEW has been established since 2009. The ERT notes these developments and encourages Bulgaria to report in more detail on its activities implemented in the area of education and public participation in its next national communication.

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

117. Bulgaria has provided most 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 the 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.

118. Bulgaria has not reported the following elements of the supplementary information required under Article 7, paragraph 2, of the Kyoto Protocol: some information on the national registry. However, during the review, Bulgaria provided information on this reporting element. The technical assessment of the information reported under Article 7, paragraph 2, is contained in the relevant sections of this report. The ERT recommends that Bulgaria provide information on all elements of reporting on the national registry in its next national communication.

Table 8

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

<i>Supplementary information</i>	<i>Reference</i>
National registry	NC5, section 3.5, page 92
National system	NC5, section 3.4, page 75
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	NC5, section 5.3, page 141
Policies and measures in accordance with Article 2	NC5, section 4.3, page 118
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	NC5, section 4.2, page 98
Information under Article 10	NC5, section 7.5, page 187
Financial resources ^a	NA

Abbreviation: NA = not applicable.

^a As a country with an economy in transition, Bulgaria does not have to report on the implementation of Article 11 of the Kyoto Protocol, including on the provision of 'new and additional' financial resources.

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

119. Bulgaria reported information on the minimization of adverse effects in accordance with Article 3, paragraph 14, of the Kyoto Protocol as part of its 2011 annual submission. During the review, Bulgaria provided the ERT with 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 the 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 partly transparent and partly complete. The ERT recommends that Bulgaria continue to explore and report on the adverse impacts of the response measures.

120. The Party's 2011 NIR and the additional information provided during the review presented several of Bulgaria's initiatives that aim to minimize adverse impacts. These

include the introduction of mandatory green certificates and a preferential tariffs scheme applied within the power generation sector as well as research on technological efficiency. Further, Bulgaria, as an EU member State, participates in activities to minimize adverse impacts related to international trade through the liberalization of trade in environmental goods and services.

III. Conclusions and recommendations

121. The ERT concludes that the NC5 generally provides a good overview of the national climate policy of Bulgaria. The information provided in the NC5 includes most of the mandatory information required by the UNFCCC reporting guidelines with the exception of: the description of how the national circumstances affect GHG emissions and removals over time; PaMs in the industrial processes and LULUCF sectors; PaMs aimed at reducing F-gases; projections on a gas-by-gas basis for PFCs, HFCs and SF₆ and projections for the LULUCF, and solvent and other product use sectors; the total estimated and expected effect of implemented and adopted PaMs; activities, actions and programmes undertaken to support capacity-building in developing country Parties in the area of research and systematic observation. The NC5 includes most elements of the supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the exception of some information on the national registry. During the review, Bulgaria provided additional information on all of the missing reporting elements.

122. Bulgaria's emissions for 2009 were estimated to be 52.2 per cent below its 1990 level, excluding LULUCF, and 56.8 per cent below, including LULUCF. Emissions in Bulgaria declined due the restructuring of economic activity caused by the radical transition process from a centrally-planned economy to a market-based economy and subsequent economic slowdown. These economic changes led in turn to a decrease in thermal power production (and an increase in hydropower and nuclear power production), structural changes in industry, including a decline in production from energy-intensive enterprises, and a decline in cattle and sheep populations and in the use of fertilizers. The declining emission trend was further supported by the introduction of energy efficiency measures in the industry and residential sectors and a shift, in primary energy consumption, from solid and liquid fuels to natural gas.

123. In its NC5, Bulgaria presented GHG projections for the period 2005–2020. Three scenarios were reported: 'without measures', 'with measures' and 'with additional measures'. Quantitative information was provided for the 'with measures' and 'with additional measures' scenarios. The updated projections for 2010 indicate that Bulgaria will meet its Kyoto Protocol target (which is an 8 per cent emission reduction compared with the base year level) under the 'with measures' and 'with additional measures' scenarios, as the emissions will drop by 45.1 per cent and 49.5 per cent below the base year level, respectively. Bulgaria may see a growth in emissions by 2020, but the GHG emissions are not expected to exceed the Kyoto Protocol target even by 2020, as according to the updated projections, the emissions are projected to be 25.5 per cent and 33.0 per cent below the base year level by 2020, under the 'with measures' and 'with additional measures' scenarios, respectively.

124. The NC5 contains information on how the Party's use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. Bulgaria is not planning to make use of the Kyoto Protocol mechanisms to meet its first commitment period Kyoto Protocol target. In its NC5, Bulgaria has provided information on how it uses the Kyoto Protocol mechanisms and in particular, GIS, which is instrumental in generating the funding that is directed to activities promoting technology transfer and energy efficiency.

125. Bulgaria has committed to implementing the EU Climate and Energy package adopted in 2008, which set the so-called ‘20-20-20’ targets. Bulgaria’s national targets are to limit the growth of its emissions by 20 per cent above the 2005 level by 2020, and to increase the share of RES, excluding large scale hydropower plants, to 16 per cent of gross final energy consumption by 2020. The target on RES is supported by the national sectoral targets, such as to reach a 20.8 per cent share of RES in electricity, a 23.8 per cent share of RES in heating and cooling, and a 10.8 per cent share of RES in transport. Bulgaria also committed to increasing its energy savings by 2016 by 9 per cent of the average final energy consumption for the period 2001–2005. To support the implementation of these targets, Bulgaria adopted the Energy Strategy 2020, the National Renewable Energy Action Plan 2020, the National Energy Efficiency Strategy 2020, and the first and the second NEEAPs. According to the information provided during the review, it appears that Bulgaria is likely to reach its national and EU targets on emission reductions, renewables and energy efficiency

126. In its NC5, Bulgaria focused more on reporting on its vulnerability to climate change effects and adverse impacts than on concrete adaptation projects, programmes, activities or actions. However, there is a definite shift in understanding the importance of adaptation, which was particularly apparent in the vulnerability and adaptation studies conducted and the pilot actions taken for that purpose.

127. In its NC5, the Party has provided information on the major projects, activities and publications related to research and systematic observation, showing that there has been an increase in interest and actions to tackle climate change in Bulgaria. The ERT concluded that Bulgaria is making some efforts with regard to education, training and public awareness, and research and systematic observation, taking advantage of programmes and resources made available by the EU on climate change and energy issues and on revenues from the carbon market.

128. The ERT concluded that Bulgaria’s national system continues to perform its required functions as set out in decision 19/CMP.1, and that the 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 relevant decisions of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol (CMP). The ERT noted that updates of databases and applications, implemented security measures and changes to the national registry software are documented on a regular basis by nominated responsible persons.

129. 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 2011 annual submission is partly complete and partly transparent.

130. In the course of the IDR, the ERT formulated several recommendations relating to the completeness and transparency of Bulgaria’s reporting under the Convention and its Kyoto Protocol. The key recommendations¹⁴ are that Bulgaria:

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

(i) The PaMs in the industrial processes and LULUCF sectors; and PaMs aimed at reducing the F-gases emissions;

¹⁴ The recommendations are given in full in the relevant sections of this report.

- (ii) The emission projections relative to the base year and to the actual inventory data; projections on a gas-by-gas basis for PFCs, HFCs and SF₆; and projections for the LULUCF and solvent and other product use sectors;
 - (iii) The total estimated and expected effect of PaMs and an explanation of how these effects are calculated;
 - (iv) Action taken to support related capacity-building in developing countries in the area of research and systematic observation;
- (b) Improve the transparency of its reporting by including, in the next national communication, the following information:
- (i) Public information available on the national registry website, as listed in paragraphs 44–48 of decision 13/CMP.1;
 - (ii) Description of the definitions of the emission projection scenarios, assumptions and key variables used for the preparation of the projections;
 - (iii) Projections using, to the extent possible, the same sectoral categories as those used in the section on PaMs;
- (c) Improve the transparency and completeness of its reporting by including, in its next annual submission on the actions taken to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol regarding the minimization of adverse impacts and on response measures to climate change, if in a position to do so.

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

- (a) Provide more detailed information on the national circumstances and on how the national circumstances are relevant to factors affecting GHG emissions and removals over time;
- (b) Provide projections of NMVOCs and SO₂;
- (c) Use the same assumptions, such as GDP growth and other variables, for all projection scenarios;
- (d) Report on its activities implemented in the area of education, training and public awareness.

IV. Questions of implementation

132. 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/2011/INF.1. Compilation and synthesis of fifth national communications. Executive summary. Note by the secretariat. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf01.pdf>>.

FCCC/SBI/2011/INF.1/Add.1. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. Policies, measures, and past and projected future greenhouse gas emission trends of Parties included in Annex I to the Convention. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf01a01.pdf>>.

FCCC/SBI/2011/INF.1/Add.2. Compilation and synthesis of fifth national communications. Note by the secretariat. Addendum. 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/2011/sbi/eng/inf01a02.pdf>>.

FCCC/SBI/2011/INF.2. Compilation and synthesis of supplementary information incorporated in fifth national communications submitted in accordance with Article 7, paragraph 2, of the Kyoto Protocol. Note by the secretariat. Available at <<http://unfccc.int/resource/docs/2011/sbi/eng/inf02.pdf>>.

FCCC/ARR/2010/BGR. Report of the individual review of the annual submission of Bulgaria submitted in 2010. Available at <<http://unfccc.int/resource/docs/2010/arr/bgr2.pdf>>.

FCCC/IRR/2007/BGR. Report of the review of the initial report of Bulgaria. Available at <<http://unfccc.int/resource/docs/2008/irr/bgr.pdf>>.

FCCC/IDR.4/BGR. Report of the centralized in-depth review of the fourth national communication of Bulgaria. Available at <<http://unfccc.int/resource/docs/2008/idr/bgr04.pdf>>.

Fourth national communication of Bulgaria. Available at <<http://unfccc.int/resource/docs/natc/bgrnc4.pdf>>.

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

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

2011 GHG inventory submission of Bulgaria. Available at
<http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/5888.php>.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Evdokia Maneva, Ms. Bistra Nikolova, Ms. Maria Yakimova, Ms. Stefka Doychinova, Mr. Kiril Bankov, Mr. Vladimir Marinov and Mr. Grigor Stoyanov (Ministry of Environment and Water); Ms. Detelina Petrova and Mr. Ivaylo Rangelov (Executive Environment Agency); Ms. Milena Tsoleva and Ms. Aksinia Trioiva (Ministry of Economy, Energy and Tourism); Mr. Filip Fikov (Sustainable Energy Development Agency); Mr. Christo Christov (Energy Institute Jsc); Ms. Kamelia Georgieva (National Trust Eco Fund); Mr. Veselin Alexandrov (National institute of Metereology and Hydrology, Bulgarian Academy of Science), including additional material on updated policies and measures, GHG projections, the national registry and recent climate policy developments in Bulgaria. The following documents¹ were also provided by Bulgaria:

Bulgarian National Report under Article 3(2) of Decision 280/2004/EC, Sofia 2011.

Summary of the Assessment Report on the implementation of the Second National Action Plan on Climate Change.

¹ Reproduced as received from the Party.