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## Report on the technical review of the seventh national communication of Bulgaria

Parties included in Annex I to the Convention were requested by decision 9/CP.16 to submit their seventh national communication to the secretariat by 1 January 2018. According to decision 15/CMP.1, Parties included in Annex I to the Convention that are also Parties to the Kyoto Protocol are required to include in their national communications supplementary information under Article 7, paragraph 2, of the Kyoto Protocol. This report presents the results of the technical review of the seventh national communication and relevant supplementary information under the Kyoto Protocol of Bulgaria, conducted by an expert review team in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention” and the “Guidelines for review under Article 8 of the Kyoto Protocol”.

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## Abbreviations and acronyms

AEA	annual emission allocation
Annex II Party	Party included in Annex II to the Convention
BR	biennial report
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
CTF	common tabular format
EEA	European Environment Agency
ERT	expert review team
ESD	effort-sharing decision
ESR	effort-sharing regulation
EU	European Union
EU ETS	European Union Emissions Trading System
ExEA	Executive Environment Agency of Bulgaria
GDP	gross domestic product
GHG	greenhouse gas
HFC	hydrofluorocarbon
ICAO	International Civil Aviation Organization
IMO	International Maritime Organization
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MoEW	Ministry of Environment and Water of Bulgaria
NA	not applicable
NC	national communication
NE	not estimated
NF <sub>3</sub>	nitrogen trifluoride
NIMH	National Institute of Meteorology and Hydrology of Bulgaria
NIR	national inventory report
NO	not occurring
non-ETS sectors	sectors not covered by the European Union Emissions Trading System
N <sub>2</sub> O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
reporting guidelines for supplementary information	“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol, Part II: Reporting of supplementary information under Article 7, paragraph 2”
SF <sub>6</sub>	sulfur hexafluoride
TNAPCC	Third National Action Plan on Climate Change
UNFCCC reporting guidelines on NCs	“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications”
WAM	‘with additional measures’
WEM	‘with measures’

## I. Introduction and summary

### A. Introduction

1. This is a report on the in-country technical review of the NC7 of Bulgaria. The review was coordinated by the secretariat in accordance with the “Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”, particularly “Part V: UNFCCC guidelines for the technical review of national communications from Parties included in Annex I to the Convention” (annex to decision 13/CP.20), and the “Guidelines for review under Article 8 of the Kyoto Protocol” (annex to decision 22/CMP.1 and annex I to decision 4/CMP.11).<sup>1</sup>

2. In accordance with the same decisions, a draft version of this report was transmitted to the Government of Bulgaria, which provided comments that were considered and incorporated into this final version of the report.

3. The review was conducted from 4 to 9 February 2019 in Sofia by the following team of nominated experts from the UNFCCC roster of experts: Ms. Laura Aranguren (Colombia), Mr. Viorel Nelu Bellmondo Blujdea (Romania), Ms. Medea Inashvili (Georgia), Mr. Naoki Matsuo (Japan) and Ms. Noura Mohamed Lotfy (Egypt). Ms. Inashvili and Mr. Matsuo were the lead reviewers. The review was coordinated by Ms. Veronica Colerio (UNFCCC secretariat).

### B. Summary

4. The ERT conducted a technical review of the information reported in the NC7 of Bulgaria in accordance with the UNFCCC reporting guidelines on NCs (decision 4/CP.5) and the reporting guidelines for supplementary information, in particular the supplementary information required under Article 7, paragraph 2, and on the minimization of adverse impacts under Article 3, paragraph 14, of the Kyoto Protocol (annex to decision 15/CMP.1 and annex III to decision 3/CMP.11).

#### 1. Timeliness

5. The NC7 was submitted on 29 December 2017, before the deadline of 1 January 2018 mandated by decision 9/CP.16.

#### 2. Completeness, transparency of reporting and adherence to the reporting guidelines

6. Issues and gaps identified by the ERT related to the reported information are presented in table 1. The information reported by Bulgaria in its NC7, including the supplementary information under the Kyoto Protocol, mostly adheres to the UNFCCC reporting guidelines on NCs.

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<sup>1</sup> At the time of the publication of this report, the Party had submitted its instrument of acceptance of the Doha Amendment; however, the Amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the Amendment.

Table 1

**Assessment of completeness and transparency of mandatory information reported by Bulgaria in its seventh national communication, including supplementary information under the Kyoto Protocol**

<i>Section of NC</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>	<i>Supplementary information under the Kyoto Protocol</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Reference to description of recommendations</i>
Executive summary	Complete	Transparent		National system	Mostly complete	Transparent	Issue 1 in table 7
National circumstances	Complete	Transparent		National registry	Mostly complete	Transparent	Issue 1 in table 8
GHG inventory	Complete	Transparent		Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Complete	Transparent	
PaMs	Mostly complete	Mostly transparent	Issues 1 and 10 in table 11	PaMs in accordance with Article 2	Complete	Transparent	
Projections and the total effect of PaMs	Partially complete	Transparent	Issues 2 and 4 in table 15 Issues 1 and 2 in table 17	Domestic and regional programmes and/or arrangements and procedures	Partially complete	Transparent	Issues 1 and 2 in table 9
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Transparent		Information under Article 10 <sup>a</sup>	NA	NA	NA
Financial resources and transfer of technology <sup>b</sup>	NA	NA	NA	Financial resources <sup>c</sup>	NA	NA	NA
Research and systematic observation	Mostly complete	Transparent	Issue 1 in table 20	Minimization of adverse impacts in accordance with Article 3, paragraph 14	Mostly complete	Transparent	Issue 11 in table 11
Education, training and public awareness	Complete	Mostly Transparent	Issue 1 in table 21				

*Note:* A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III below. The assessment of completeness and transparency by the ERT in this table is based only on the “shall” reporting requirements.

<sup>a</sup> The assessment refers to information provided by the Party on the provisions contained in Article 4, paragraphs 3, 5 and 7, of the Convention reported under Article 10 of the Kyoto Protocol, which is relevant to Annex II Parties only. Assessment of the information provided by the Party on the other provisions of Article 10 of the Kyoto Protocol is provided under the relevant substantive headings under the Convention, for example research and systematic observation.

<sup>b</sup> Bulgaria is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention.

<sup>c</sup> Bulgaria is not an Annex II Party and is therefore not obliged to provide information on financial resources under Article 11 of the Kyoto Protocol, including on “new and additional” resources.

### 3. Summary of reviewed supplementary information under the Kyoto Protocol

7. The supplementary information under Article 7, paragraph 2, of the Kyoto Protocol is incorporated in different sections of the NC7, and the supplementary information under Article 7, paragraph 1, of the Kyoto Protocol is reported in the NIR of the 2018 annual submission. Table 2 provides references to where the information is reported. The technical assessment of the information reported under Article 7, paragraphs 1 and 2, of the Kyoto Protocol is contained in the relevant sections of this report.

Table 2

#### Overview of supplementary information under the Kyoto Protocol reported by Bulgaria

<i>Supplementary information</i>	<i>Reference to section of NC7</i>
National registry	Section 3.10
National system	Sections 3.2 and 3.3
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17	Section 5.4
PaMs in accordance with Article 2	Section 4.6
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	Section 4.3
Information under Article 10	Sections 3.3, 4.6, 6.4, 7.2, 8 and 9
Financial resources <sup>a</sup>	NA
Minimization of adverse impacts in accordance with Article 3, paragraph 14	Reported in the NIR of the Party's 2018 annual submission

<sup>a</sup> Reporting on financial resources under the Kyoto Protocol is relevant to Annex II Parties. As Bulgaria is not an Annex II Party, it does not have an obligation to provide information on financial resources under Article 11 of the Kyoto Protocol, including on "new and additional" resources.

## II. Technical review of the information reported in the seventh national communication, including the supplementary information under the Kyoto Protocol

### A. Information on national circumstances and greenhouse gas emissions and removals

#### 1. National circumstances relevant to greenhouse gas emissions and removals

##### (a) Technical assessment of the reported information

8. The national circumstances of Bulgaria explain the relationship between its historical and future emission trends and the climate change policy agenda. The NC7 contains key information on legislation, governmental structure, population trends, geography, climate and climate change, economic profile and its trends, energy, transport, the buildings sector, industry, taxes and tax policy, trade, agriculture, land use, forestry, national resources, biodiversity, protected areas, waste and wastewater. Bulgaria reported on the changes in its governmental structure, such as the number of ministries, and added new and updated information and materials, including illustrations, figures and tables (climatic scenarios, population profile, economic profile, agriculture, forestry, taxation policy, transport) as well as policy measures and documents elaborated since the previous submission (waste, forestry, agriculture).

9. The ERT noted that during the period 1990–2016 the Party’s GDP per capita (in thousands of 2011 USD using purchasing power parity) increased by 90.5 per cent, while GHG emissions per GDP unit and GHG emissions per capita decreased by 63.5 and 30.5 per cent, respectively. Bulgaria has managed to decouple GHG emissions from the economic activities: macroeconomic and financial stability have been achieved through administrative rules (e.g. introduction of the currency board and the denomination of the Bulgarian lev in 1999, sound fiscal policy, limited pay rises, increasing net exports, privatization of some enterprises leading to closure of ineffective ones, free access to the growing European market, financial and technical support from the EU, taxation policy oriented towards decreasing the share of the shadow economy and combating tax evasion and avoidance) on the one hand (economic growth), while active efforts in the direction of reforms and technical and technological renovation of the economic sectors have led to increases in efficiency and the use of renewable energy and biofuels on the other hand (emission reduction). Table 3 illustrates the national circumstances of Bulgaria by providing some indicators relevant to emissions and removals.

Table 3

**Indicators relevant to greenhouse gas emissions and removals for Bulgaria for the period 1990–2016**

<i>Indicator</i>							<i>Change (%)</i>	
	<i>1990</i>	<i>2000</i>	<i>2010</i>	<i>2015</i>	<i>2016</i>	<i>1990–2016</i>	<i>2015–2016</i>	
GDP per capita (thousands 2011 USD using purchasing power parity)	9.30	8.96	15.28	17.00	17.71	90.5	4.2	
GHG emissions without LULUCF per capita (t CO <sub>2</sub> eq)	11.93	7.29	8.19	8.60	8.29	–30.5	–3.7	
GHG emissions without LULUCF per GDP unit (kg CO <sub>2</sub> eq per 2011 USD using purchasing power parity)	1.28	0.81	0.54	0.51	0.47	–63.5	–7.5	

*Sources:* (1) GHG emission data: Bulgaria’s 2018 GHG inventory submission, version 1; (2) population and GDP: World Bank.

*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.

10. Bulgaria has requested flexibility in accordance with Article 4, paragraphs 6 and 10, of the Convention in relation to the base-year definition. 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.

**(b) Assessment of adherence to the reporting guidelines**

11. The ERT assessed the information reported in the NC7 of Bulgaria and identified an issue relating to completeness and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 4.

Table 4

**Findings on national circumstances relevant to greenhouse gas emissions and removals from the review of the seventh national communication of Bulgaria**

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 8  Issue type: completeness  Assessment: encouragement	<p>In its NC7 the Party reported information on its national circumstances, including on governmental structure, population trends, geography, climate and climate change, economic profile, energy, transport, the buildings sector, industry, taxes and tax policy, trade, agriculture, land use, forestry, national resources, biodiversity, protected areas, waste and wastewater. However, the ERT noted that this information does not provide clarity on how the national circumstances of Bulgaria are relevant to factors affecting its GHG emissions and removals, as requested in paragraph 8 of the UNFCCC reporting guidelines on NCs.</p> <p>During the review Bulgaria provided information on reforms in different economic sectors (e.g. waste and transport) aimed at influencing future GHG emissions. However, the ERT notes that this information does not fully cover all the factors that have an impact on GHG emissions.</p> <p>The ERT reiterates the encouragement made in the previous review report that Bulgaria provide information on how its national circumstances are relevant to factors affecting GHG emissions and removals, including disaggregated indicators, to explain the relationship between national circumstances and emissions or removals.</p> <p>The ERT noted that the Sustainable Energy Development Agency under the Ministry of Energy undertook a factor analysis of energy consumption for 2000–2015 in the report <i>Energy Efficiency Trends and Policies in Bulgaria</i> (2018). The relevant study for GHGs (energy-related CO<sub>2</sub>) included in the report could clarify the associated factors for historical GHG emission growth/decrease, provide a better understanding of such factors and contribute to the future scenario analyses and design of effective PaMs.</p>

Note: Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

**2. Information on greenhouse gas inventory arrangements, emissions, removals and trends**

**(a) Technical assessment of the reported information**

12. Total GHG emissions<sup>2</sup> excluding emissions and removals from LULUCF decreased by 43.2 per cent between 1990 and 2016, whereas total GHG emissions including net emissions or removals from LULUCF decreased by 41.1 per cent over the same period. Table 5 illustrates the emission trends by sector and by gas for Bulgaria.

Table 5

**Greenhouse gas emissions by sector and by gas for Bulgaria for the period 1990–2016**

	GHG emissions (kt CO <sub>2</sub> eq)					Change (%)		Share (%)	
	1990	2000	2010	2015	2016	1990–2016	2010–2016	1990	2016
Sector									
1. Energy	73 503.72	40 772.76	46 044.06	45 520.81	42 386.48	–42.3	–6.9	70.7	71.8
A1. Energy industries	38 676.85	24 076.86	31 638.28	30 316.87	27 127.91	–29.9	–10.5	37.2	45.9

<sup>2</sup> In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of CO<sub>2</sub> eq excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated on the basis of the Party’s 2018 annual submission, version 1.



	GHG emissions (kt CO <sub>2</sub> eq)					Change (%)		Share (%)	
	1990	2000	2010	2015	2016	1990–2016	2015–2016	1990	2016
	A2. Manufacturing industries and construction	17 768.46	7 228.39	3 156.65	2 861.86	2 910.22	–83.6	1.7	17.1
A3. Transport	6 604.56	5 510.01	8 007.94	9 237.63	9 350.49	41.6	1.2	6.4	15.8
A4. and A5. Other	8 132.72	2 579.06	2 112.03	1 920.70	1 964.52	–75.8	2.3	7.8	3.3
B. Fugitive emissions from fuels	2 321.12	1 378.44	1 129.16	1 183.75	1 033.33	–55.5	–12.7	2.2	1.7
C. CO <sub>2</sub> transport and storage	NO	NO	NO	NO	NO	NA	NA	NA	NA
2. IPPU	10 046.88	7 210.14	4 444.69	5 769.03	6 062.36	–39.7	5.1	9.7	10.3
3. Agriculture	12 461.57	5 205.33	5 454.64	6 236.25	6 529.07	–47.6	4.7	12.0	11.1
4. LULUCF	–14 870.36	–9 427.62	–9 121.17	–6 330.01	–6 536.39	–56.0	3.3	NA	NA
5. Waste	7 977.03	6 380.67	4 604.56	4 221.86	4 081.82	–48.8	–3.3	7.7	6.9
6. Other	NO	NO	NO	NO	NO	NA	NA	NA	NA
<b>Gas<sup>a</sup></b>									
CO <sub>2</sub>	78 672.94	45 213.93	47 792.80	48 132.69	45 287.39	–42.4	–5.9	75.7	76.7
CH <sub>4</sub>	16 149.61	10 149.40	7 736.22	7 339.68	7 048.43	–56.4	–4.0	15.5	11.9
N <sub>2</sub> O	9 162.96	4 166.06	4 337.06	5 035.39	5 304.70	–42.1	5.3	8.8	9.0
HFCs	NO, NA	33.02	663.05	1 222.10	1 400.45	NA	14.6	NA	2.4
PFCs	NO, NA	NO, NA	0.06	0.03	0.02	NA	–15.8	NA	0.0
SF <sub>6</sub>	3.69	6.49	18.76	18.07	18.75	407.5	3.8	0.0	0.0
NF <sub>3</sub>	NO, NA	NO, NA	NO, NA	NO, NA	NO, NA	NA	NA	NA	NA
<b>Total GHG emissions without LULUCF</b>	<b>103 989.21</b>	<b>59 568.90</b>	<b>60 547.96</b>	<b>61 747.96</b>	<b>59 059.73</b>	<b>–43.2</b>	<b>–4.4</b>	<b>100.0</b>	<b>100.0</b>
<b>Total GHG emissions with LULUCF</b>	<b>89 118.85</b>	<b>50 141.28</b>	<b>51 426.79</b>	<b>55 417.94</b>	<b>52 523.35</b>	<b>–41.1</b>	<b>–5.2</b>	<b>NA</b>	<b>NA</b>

Source: GHG emission data: Bulgaria's 2018 annual submission, version 1.

<sup>a</sup> Emissions by gas without LULUCF and without indirect CO<sub>2</sub>.

13. The decrease in the total emissions was driven mainly by factors such as the deep economic recession due to the collapse of the centralized planned economy (1988–1991), economic crises (1998 and 2008) and the underlying continuous change in economic structure from heavy industry to service sectors.

14. Between 1990 and 2016, GHG emissions from the energy sector decreased by 42.3 per cent (31,117.24 kt CO<sub>2</sub> eq), owing mainly to the structural change of the economy. The trend in GHG emissions from fuel combustion showed notable decreases in manufacturing industries and construction (83.6 per cent or 14,858.24 kt CO<sub>2</sub> eq) and energy use in service sectors (75.8 per cent or 6,168.20 kt CO<sub>2</sub> eq) in this period. For the energy supply industry sector, the ERT observed a decrease in emissions of 29.9 per cent (1990–2016), which was mainly caused by the decline of final energy consumption for stationary sources, while the shift to less carbon-intensive fuels was limited. During the review, Bulgaria clarified that there has been a shift from on-site energy use to energy supply industries. On the other hand, GHG

emissions from the transportation sector show a rapid increase (41.6 per cent or 2,745.93 kt CO<sub>2</sub> eq for 1990–2016) driven by a strong growth in demand for automobile-based transport.

15. Between 1990 and 2016, GHG emissions from IPPU decreased by 39.7 per cent (3,984.52 kt CO<sub>2</sub> eq), owing mainly to a decline in the production of metal, mineral and chemical products driven by economic crises. Between 1990 and 2016, GHG emissions from the agriculture sector decreased by 47.6 per cent (5,932.50 kt CO<sub>2</sub> eq), owing mainly to systematic declines in the agricultural land area due to abandonment of arable lands and reduction in livestock populations. The LULUCF sector was a net sink of 6,536.39 kt CO<sub>2</sub> eq in Bulgaria in 2016; net GHG removals have decreased by 56.0 kt CO<sub>2</sub> eq since 1990. The trend was mainly driven by the fall in removals from the category forest land, driven by the decline in the rate of forest growth as the average forest age increases. Between 1990 and 2016, GHG emissions from the waste sector decreased by 48.8 per cent (3,895.21 kt CO<sub>2</sub> eq), owing mainly to a steady decline in the population.

16. As shown in table 5, CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions decreased by 42.4, 56.4 and 42.1 per cent, respectively, during 1990–2016. The main sources of these GHGs are the energy sector for CO<sub>2</sub>, and the agriculture and waste sectors for CH<sub>4</sub> and N<sub>2</sub>O. On the other hand, emissions from the IPPU sector (HFCs and SF<sub>6</sub>) increased considerably to 1,400.45 kt CO<sub>2</sub> eq and 18.75 kt CO<sub>2</sub> eq, respectively, in 2016 (i.e. over 10-fold during the period 1995–2006), driven by the substitution of ozone-depleting substances for fluorinated gases in many applications, while PFC and NF<sub>3</sub> emissions were negligible.

17. The summary information provided by the Party on GHG emissions was consistent with the information reported in its 2017 annual submission.

**(b) Assessment of adherence to the reporting guidelines**

18. The ERT assessed the information reported in the NC7 of Bulgaria and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 6.

Table 6

**Findings on greenhouse gas inventory information from the review of the seventh national communication of Bulgaria**

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 12  Issue type: transparency  Assessment: encouragement	<p>Bulgaria described the factors affecting its historical emission trends from 1988 in its NC7. The ERT noted that this is in accordance with the UNFCCC reporting guidelines on NCs; however, the reporting was not sufficiently transparent because the underlying analytical information was not provided, such as how GDP growth and the structural change of the economy have affected such trends, taking into account non-incidental aspects. In addition, descriptions of some specific events (e.g. the global financial crisis in 2008) are not well summarized in terms of GHG emissions.</p> <p>During the review Bulgaria explained, by referring to specific years, that a few events related to economic crises and climatic anomalies drove temporal drops in emissions.</p> <p>The ERT encourages Bulgaria to provide a transparent description of the factors underlying emissions trends. The ERT notes that Bulgaria could undertake, for example, a more detailed, preferably quantitative, analysis of factors affecting the historical emission trends, especially for underlying factors, because this information as well as analytical exercises could provide a deeper understanding and insights for future projections as well as for designing the PaMs.</p> <p>The ERT found a good domestic analysis example in <i>Energy Efficiency Trends and Policies in Bulgaria</i> (e.g. figure 7), published by the Sustainable Energy Development Agency in 2018, which could provide for such a deeper understanding and be used as the basis for future NCs.</p>

*Note:* Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

### 3. National system for the estimation of anthropogenic emissions by sources and removals by sinks

#### (a) Technical assessment of the reported information

19. Bulgaria provided in the NC7 a description of how its national system for the estimation of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol is performing the general and specific functions defined in the annex to decision 19/CMP.1. The description includes all the elements mandated by paragraph 30 of the annex to decision 15/CMP.1.

20. The ERT identified multiple typographical errors and inconsistencies in the text of the NC7, indicating a systemic problem of quality control. In this regard, the ERT suggests that Bulgaria enhance its quality control system for the final stage of its preparation of the text of the NC.

#### (b) Assessment of adherence to the reporting guidelines

21. The ERT assessed the information reported in the NC7 of Bulgaria and identified an issue relating to completeness and adherence to the UNFCCC reporting guidelines for supplementary information. The finding is described in table 7.

Table 7

#### Findings on the national system for the estimation of anthropogenic emissions by sources and removals by sinks from the review of the seventh national communication of Bulgaria

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 30	Bulgaria reported the reason why recalculations were made for the period 1988–2014. However, the ERT noted that Bulgaria did not report the description of the process for the recalculation of previously submitted inventory data.
	Issue type: completeness	During the review Bulgaria provided the links to the NIR of the 2017 submission for recalculations and explained that the estimation of fluorinated gas (PFC) emissions has been revised.
	Assessment: recommendation	The ERT recommends that Bulgaria include in its next NC the description of the process for the recalculation of previously submitted inventory data or provide the references to the relevant section of the NIR.

*Note:* Paragraph number listed under reporting requirement refers to the relevant paragraph of the reporting guidelines for supplementary information. The reporting on the requirements not included in this table is considered to be complete and transparent.

### 4. National registry

#### (a) Technical assessment of the reported information

22. In the NC7 Bulgaria provided some information on how its national registry performs the functions in accordance with the annex to decision 13/CMP.1 and the annex to decision 5/CMP.1 and complies with the requirements of the technical standards for data exchange between registry systems. The ERT took note of the review of the changes to the national registry reflected in the report on the individual review of the 2018 annual submission of Bulgaria.

#### (b) Assessment of adherence to the reporting guidelines

23. The ERT assessed the information reported in the NC7 of Bulgaria and identified an issue relating to completeness and adherence to the UNFCCC reporting guidelines for supplementary information. The finding is described in table 8.

Table 8

**Findings on the national registry from the review of the seventh national communication of Bulgaria**

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 32  Issue type: completeness  Assessment: recommendation	<p>The ERT noted that Bulgaria reported only on the changes in the national registry since the previous submission and did not provide the information requested in paragraph 32(c)–(f), (i) and (j) of the reporting guidelines for supplementary information. In addition, the changes reflected in the NC7 refer to those made after version 6.7.3 of the national registry whereas the latest version 8.0.7 was adopted in 2016, with an intermediate 7.0.1 version.</p> <p>During the review, Bulgaria provided additional material explaining the changes from version 7.0.1 to version 8.0.7 of the national registry, providing additional information on the national registry and on data exchange and technical specifications for the Consolidated System of European Registries.</p> <p>The ERT recommends that Bulgaria provide in its next NC a description of its national registry reflecting the latest version of the registry and provide all the information required by the reporting guidelines for supplementary information, including paragraph 32(c)–(f), (i) and (j).</p>

*Note:* Paragraph number listed under reporting requirement refers to the relevant paragraph of the reporting guidelines for supplementary information. The reporting on the requirements not included in this table is considered to be complete and transparent.

## **B. Information on policies and measures and institutional arrangements**

### **1. Domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol**

#### **(a) Technical assessment of the reported information**

24. For the second commitment period of the Kyoto Protocol, from 2013 to 2020, Bulgaria committed to contributing to the joint EU effort to reduce GHG emissions by 20 per cent below the base-year (1990) level. Implementation of the Kyoto Protocol by Bulgaria is underpinned by the EU 2020 climate and energy package, which sets emission reduction targets for 2020, including targets for the member States for the non-ETS sectors under the ESD. Under the EU ETS, emissions in selected industries and production processes are capped by quantity limits throughout the EU.

25. The overall responsibility for climate change policymaking lies with MoEW and a number of national institutions such as the Inter-Ministerial Working Group and ExEA. Bulgaria's participation in the Kyoto Protocol mechanisms is mostly led by the management bodies of the National Trust Eco Fund: the Board of Directors, Advisory Committee and Executive Bureau, the last of which manages and evaluates projects at the implementation stage and thereafter.

26. Bulgaria has legislative arrangements and administrative procedures in place to make information publicly accessible through, for example, the State Gazette, official publications issued by the National Assembly, national legislative acts, decrees of the President, decisions of the Constitutional Court, rules and regulations of the Council of Ministers and international agreements relevant to Bulgaria. The State Gazette maintains a publicly accessible free website.<sup>3</sup>

27. Bulgaria has national legislative arrangements, such as the Forestry Act, Biological Diversity Act and Protected Areas Act, and administrative procedures that seek to ensure sustainable use of natural resources and conservation of biodiversity in the process of the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

<sup>3</sup> <http://dv.parliament.bg/DVWeb/index.faces>.

**(b) Assessment of adherence to the reporting guidelines**

28. The ERT assessed the information reported in the NC7 of Bulgaria and identified issues relating to completeness and adherence to the UNFCCC reporting guidelines for supplementary information. The findings are described in table 9.

Table 9

**Findings on domestic and regional programmes and/or legislative arrangements and procedures related to the Kyoto Protocol from the review of the seventh national communication of Bulgaria**

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 37  Issue type: completeness  Assessment: recommendation	<p>The Party reported in its NC7 the required information on its domestic and regional legislative arrangements and administrative procedures established pursuant to the implementation of the Kyoto Protocol, according to its national circumstances. However, Bulgaria has not reported information on the enforcement procedures it has in place to meet its commitments under the Kyoto Protocol.</p> <p>During the review Bulgaria explained that, at the national level, the administrative procedures and institutional arrangements for enforcement in the cases of non-compliance with the policies related to climate change are set out in the Climate Change Mitigation Act. Bulgaria further explained that all the compliance-related issues are considered by the Party under the commitments to the EU and non-compliance is regulated by EU regulations.</p> <p>The ERT recommends that Bulgaria report in its next NC any relevant information on the enforcement and administrative procedures it has in place to meet its commitments under the Kyoto Protocol, including the procedures for addressing cases of non-compliance. The ERT notes the importance of reporting on the domestic legislation on compliance-related issues (assessment of compliance and addressing non-compliance, if any) corresponding to EU regulations and the relationship between the two levels of legislation.</p>
2	Reporting requirement specified in paragraph 38  Issue type: completeness  Assessment: recommendation	<p>The Party has not reported in its NC7 a description of any national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contributes to the conservation of biodiversity and sustainable use of natural resources.</p> <p>During the review Bulgaria provided detailed information on the legislative acts, such as the Forestry Act, Biological Diversity Act and Protected Areas Act, that ensure sustainable use of natural resources and conservation of biodiversity in the process of the implementation of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.</p> <p>The ERT recommends that the Party provide in its next NC information on national legislative arrangements and administrative procedures that seek to ensure that the implementation of activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol also contribute to the conservation of biodiversity and sustainable use of natural resources.</p>

*Note:* Paragraph number listed under reporting requirement refers to the relevant paragraph of the reporting guidelines for supplementary information. The reporting on the requirements not included in this table is considered to be complete and transparent.

**2. Policies and measures, including those in accordance with Article 2 of the Kyoto Protocol****(a) Technical assessment of the reported information**

29. Bulgaria provided information on its package of PaMs implemented, adopted and planned, by sector and by gas, in order to fulfil its commitments under the Convention and its Kyoto Protocol. Bulgaria reported on its policy context and provided limited information about the legal and institutional arrangements put in place to implement its commitments and monitor and evaluate the effectiveness of its PaMs. During the review, the Party provided additional information about the legal and institutional arrangements defined under the third National Action Plan on Climate Change (May 2012) to monitor and report PaMs, including its progress report released in June 2017 (see issue 7 in table 11).

30. Bulgaria provided information on a set of PaMs similar to those previously reported, with the exception of PaMs no longer in place. Within each sector, PaMs are organized first into priority axes and then subdivided into PaMs with direct and indirect impacts on the reduction of GHG emissions. Each policy or measure includes a textual description, supplemented by a summary table with additional information about GHGs covered, status of implementation and estimated mitigation impacts in kt CO<sub>2</sub> eq. During the review the Party explained that no changes had been made since the previous submission to its institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its target.

31. Bulgaria gave priority to implementing the PaMs that make the most significant contribution to its emission reduction efforts. During the review Bulgaria provided information on how it believes PaMs for the energy, industrial processes, agriculture and waste sectors are modifying longer-term trends in anthropogenic GHG emissions and removals in accordance with the objective of the Convention (see issue 10 in table 11). Bulgaria reported on how it periodically updates its PaMs to reduce greater levels of emissions and on the PaMs that have been discontinued since the previous submission.

32. Some PaMs are deferred to the regional level. The implementation of energy efficiency programmes, use of renewable energy and improvements to central heating systems and transportation infrastructure are implemented through Bulgarian regional bodies. Additionally, waste management plans and waste management measures are commonly formulated and implemented under regional institutions.

33. The key overarching related cross-sectoral policy in the EU is the 2020 climate and energy package, adopted in 2009, which includes the revised EU ETS and the ESD. The package is supplemented by renewable energy and energy efficiency legislation and legislative proposals on the 2020 targets for CO<sub>2</sub> emissions from cars and vans, the carbon capture and storage directive and the general programmes for environmental conservation, namely the 7<sup>th</sup> Environment Action Programme and the clean air policy package.

34. In operation since 2005, the EU ETS is a cap-and-trade system that covers all significant energy-intensive installations (mainly large point emissions sources such as power plants and industrial facilities), which contribute to 40–45 per cent of the GHG emissions of the EU. It is expected that the EU ETS will guarantee that the 2020 target (a 21 per cent emission reduction below the 2005 level) will be achieved for sectors under the scheme. Bulgaria joined the EU ETS in 2007. The third phase of the EU ETS started in 2013 and the system now includes aircraft operations (since 2012) as well as N<sub>2</sub>O emissions from chemical industry, PFC emissions from aluminium production and CO<sub>2</sub> emissions from some industrial processes, which were not covered in the previous phases of the EU ETS (since 2013).

35. The ESD became operational in 2013 and covers sectors outside the EU ETS, including transport (excluding domestic and international aviation, and international maritime transport), residential and commercial buildings, agriculture and waste, together accounting for 55–60 per cent of the GHG emissions of the EU. The aim of the ESD is to decrease GHG emissions in the EU by 10 per cent below the 2005 level by 2020 and it includes binding annual targets for each member State for 2013–2020.

36. Bulgaria highlighted its participation as an EU member State in the EU-wide mitigation actions that are under development, namely the EU ESR (842/2013) and a regulation on LULUCF (841/2013), as part of the EU climate and energy framework 2020–2030. The associated target of Bulgaria under ESR is 0 per cent in 2030 in comparison with the 2005 level. The ERT was informed that Bulgaria prepared a new strengthened package of PaMs in late 2018, which is currently under EU review, with a view to meeting the 2030 ESR target.

37. Bulgaria's third National Action Plan on Climate Change for 2013–2020 provides measures and targets for the reduction of GHG emissions, for improvements for energy efficiency across all sectors and for the introduction of renewable energy sources. Bulgaria's mitigation actions are consistent with its participation in the EU ETS and its commitments under the EU climate and energy package. The mitigation actions are stated as being consistent with the potential of the national economy to reduce emissions. Among the

mitigation actions that are critical for Bulgaria's contribution to attaining the EU-wide 2020 emission reduction target are predominantly those in the energy sector followed by the transport and waste sectors, as assessed in the "First official report on the implementation of the TNAPCC 2013-2020".

38. Bulgaria highlighted the domestic mitigation actions that are under development, such as utilizing energy efficiency potential, which are expected to have effect until 2020. Bulgaria is developing market mechanisms and incentives to reduce fuel and energy consumption (marketing of 'white' certificates/certificates of energy savings) in order to respond to the EU policy on improving energy efficiency in end-use consumption by saving annually fuel and energy equivalent to 1.5 per cent of the total energy provided on the market for the previous year (excluding energy in transport) until 2020. In the residential and commercial sector a significant impact is expected from the renovation of communal, public and state buildings. A rate of 3 per cent of the total floor area of heated and/or cooled central government buildings is renovated each year to meet at least the minimum energy performance (i.e. the target for the number of retrofitted state-owned and municipal buildings is 1,500 per year by 2020). Among the mitigation actions that provide a foundation for significant emission reductions for Bulgaria are the use of biomass and waste as an alternative fuel in combustion units of installations, the rehabilitation and modernization of the existing road infrastructure and the introduction of mandatory energy efficiency schemes (reduction of end-use consumption of fuel and energy). Table 10 provides a summary of the reported information on the PaMs of Bulgaria.

Table 10  
Summary of information on policies and measures reported by Bulgaria

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO<sub>2</sub> eq)</i>	<i>Estimate of mitigation impact by 2030 (kt CO<sub>2</sub> eq)</i>
Policy framework and cross-sectoral measures	EU ETS	NE	NE
	ESD	NE	NE
Energy	Fuel substitution from coal to natural gas	2 700	2 700
	Improvement of energy production efficiency in existing coal-fired power plants	466	585
Transport	Introduction of intelligent transport systems along the national and urban road networks	170	170
	Increasing the share of electric public transport – railways, trolley, tram, metro	127	127
	Increasing the share of biofuels	101	101
Renewable energy	Increasing the share of energy from renewable sources in the electricity generation mix	NE	NE
	Increasing the share of heating and cooling based on renewable energy sources	61	70
Energy efficiency	Increase in high-efficiency combined heat and power production	200	200
	Programme for accelerated gasification	370	310
IPPU	Audits for energy efficiency	119	119
Agriculture	Improvement of the use and management of manure, including the introduction of low-carbon practices for processing manure (e.g. composting, transformation of manure	0.24	0.24

<i>Sector</i>	<i>Key PaMs</i>	<i>Estimate of mitigation impact by 2020 (kt CO<sub>2</sub> eq)</i>	<i>Estimate of mitigation impact by 2030 (kt CO<sub>2</sub> eq)</i>
	into biogas under anaerobic conditions)		
	Encouraging the use of suitable crop rotation, especially with crops fixing atmospheric nitrogen	1	1
Waste	Capture and burning of biogas in all new and existing regional landfills	634	634
	Introduction of anaerobic stabilization of sludge with management, capture and burning of biogas in new plants and plants under reconstruction in settlements with a population of over 20,000	128	128
	Construction of installations for mechanical and biological treatment and installations for treatment and recovery of compost and biogas	728	728

*Note:* The estimates of mitigation impact are estimates of emissions of CO<sub>2</sub> or CO<sub>2</sub> eq avoided in a given year as a result of the implementation of mitigation actions.

**(b) Policies and measures in the energy sector**

39. **Energy supply.** In Bulgaria more than 70 per cent of gross energy demand is supplied by importation of fuels. The country is highly dependent on imported natural gas and crude oil, with the traditional sole origin being the Russian Federation. According to the information provided in the NC7, the share of fuels for electricity production in 2015 was gaseous fuels (48.8 per cent), followed by imported coal (31.8 per cent), local coal (16.8 per cent), nuclear energy (2.1 per cent), liquid fuels (0.3 per cent) and biofuels (0.2 per cent); natural gas was the main fuel for the production of heat. The energy industries are responsible for the largest amount of GHG emissions in the country, accounting for 30,316.87 kt CO<sub>2</sub> eq in 2015. About 92 or 93 per cent of total GHG emissions in the sector is related to electricity generation, 6 or 7 per cent comes from thermal energy generation and about 1 per cent is emitted by the transmission of natural gas. About 70 per cent of the total emissions from electricity generation is produced by only three large power plants burning lignite coal.

40. Bulgaria has established a target for saving primary energy under the Energy Strategy of Bulgaria until 2020<sup>4</sup> within the framework of EU strategy Europe 2020. The target is to reduce primary energy intensity against GDP by 50 per cent by 2020 compared with the 2005 level. The result achieved so far, according to the NC7, is a reduction of more than 23 per cent against the baseline development scenario specified in the Energy Strategy (page 26), which is consistent with the intensity target.

41. Measures for the energy supply sector covered by the EU ETS include (1) improvement of energy production efficiency in existing coal-fired power plants and (2) fuel substitution from coal to natural gas. These two main policies expect emission reductions of around 3,166 kt CO<sub>2</sub> per year by 2020. The ERT noted that in the “First official report on the implementation of the third national action plan on climate change 2013–2020” the Ministry of Energy has proposed withdrawal of measure (2) because it is economically unsuitable for operators of coal-fired plants, whereas for measure (1) the results reported are around 423.8 kt CO<sub>2</sub> eq in 2014.

42. **Renewable energy sources.** A policy on increasing the share of electrical energy from renewable energy sources in the electricity generation matrix by 2020 was adopted in the National Action Plan for Renewable Energy and the Renewable Energy Act, whereby the

<sup>4</sup> Available at:

[https://www.me.government.bg/files/useruploads/files/epsp/23\\_energy\\_strategy2020%D0%95ng\\_.pdf](https://www.me.government.bg/files/useruploads/files/epsp/23_energy_strategy2020%D0%95ng_.pdf)



target set was 16 per cent in terms of share of renewables in final energy consumption by 2020, including a 10 per cent share of biofuels in transport final consumption.

43. Under the PaMs reported by Bulgaria in its NC7 targeting renewable energy sources, the main PaMs in terms of GHG emission reductions are (1) increasing the share of electrical energy from renewable energy sources in the electricity generation mix and (2) increasing the share of heating and cooling based on renewable energy sources. Together these two measures are intended to support compliance with the national target of achieving a 16 per cent share of renewables in the final energy consumption by 2020. The ERT noted that in the “First official report on the implementation of the third national action plan on climate change 2013–2020” the shares of electricity generation from renewable energy in gross final consumption of energy are 18.9 per cent (2013), 18.9 per cent (2014) and 19.1 per cent (2015), amounting to a total of 3,837 kt CO<sub>2</sub> eq for the period of implementation of the measure until 2014. Additionally, there is a 28.3 per cent share of renewable energy sources for heating and cooling in gross final energy consumption in 2014. From the information provided by the Party, the ERT understands that Bulgaria is on track to comply with the target set for 2020.

44. **Energy efficiency.** According to its commitments within the EU framework, Bulgaria has set a target to reduce the energy intensity of its GDP by 50 per cent by 2020. In order to reach this target, Bulgaria reported, among others, one energy efficiency measure to increase the efficiency of cogeneration for electricity and heating production. The target of the measure is to reduce GHG emissions by about 200 kt CO<sub>2</sub> eq per year by 2020. Bulgaria’s energy strategy (Article 21(1)(8) of the Energy Act) states that the Energy and Water Regulatory Commission is in charge of price regulation and setting preferential prices for electricity generated by high-efficiency cogeneration. According to the results reported, in 2013 36 companies involved in cogeneration obtained 38 certificates of origin, followed in 2014 by 31 companies obtaining 34 certificates. At the end of 2014, GHG emission reductions amounted to 169 kt CO<sub>2</sub> eq.

45. **Residential and commercial sectors.** The National Energy Strategy of Bulgaria envisages access to the gas distribution system by 30 per cent of households in 2020. The ERT noted that the current level is not reported, although the NC7 reported an alternative pessimistic scenario where only 15 per cent of households would access the gas distribution system. A key mitigation action under implementation is the replacement of obsolete and inefficient equipment used for heating and air conditioning, including financial incentives combining existing schemes with mandatory co-financing by the beneficiary. The measure involves activities to control and inspect heating and air-conditioning installations, in accordance with the regulation adopted pursuant to Article 15 of directive 2009/125/EC establishing a framework for the setting of eco-design requirements for energy-related products. The measure expects emission reductions of around 9 kt CO<sub>2</sub> per year by 2020.

46. During the review, the Party provided the main results of the measures in the document “First official report on the implementation of the third national action plan on climate change 2013–2020”. The ERT noted that the measures in this sector accounted for 283.7 kt CO<sub>2</sub> per year in total.

47. **Transport sector.** The main policy in Bulgaria for the transport sector is the Integrated Transport Strategy, which outlines the principal objectives for the development of the sector by 2030. These objectives are an increase in the effectiveness and competitiveness of the sector, improvement of transport connectivity and access (internal and external) and limiting the negative effects of sector development.

48. The transport sector in Bulgaria reached emissions of 9,237.63 kt CO<sub>2</sub> eq in 2015. The highest contributors to GHG emissions are passenger cars, heavy-duty vehicles, light-duty vehicles and motorcycles and mopeds. According to decision 06/2009/EC, Bulgaria was assigned an individual target allowing it to increase emissions from non-ETS sectors (e.g. the transport sector) by 20 per cent of total GHG emissions by 2020 compared with the 2005 level. According to the third National Action Plan on Climate Change for 2013–2020 there is an additional transport sector target to reduce GHG emissions by about 20 per cent below the 2008 level by 2030. The ERT noted that the transport sector is the only sector which has shown a large growth in GHG emissions (41.6 per cent increase for 1990–2016, while others experienced large decreases).

49. Among the PaMs reported by Bulgaria in its NC7, the most significant in terms of GHG emission reductions are focused on the introduction of intelligent transport systems along the national and urban road networks, increasing the share of electric public transport and increasing the share of biofuels. The overall expected effect of these three measures is 398 kt CO<sub>2</sub> eq by 2020. During the review, Bulgaria provided results of the implementation of these measures through the “First official report on the implementation of the third national action plan on climate change 2013–2020”. The three measures achieved an emission reduction of 986,56 kt CO<sub>2</sub> eq in 2013–2016. The ERT further noted that despite the high share of aged vehicles strongly influencing GHG emissions from the transport sector Bulgaria has not reported PaMs that address this issue.

50. The NC7 includes information on how Bulgaria promotes and implements the decisions of ICAO and IMO to limit emissions from international aviation and marine bunker fuels. In April 2015 an EU regulation was adopted on the monitoring, reporting and verification of CO<sub>2</sub> emissions from marine transport. This regulation took effect in 2018 and Bulgaria is in the process of implementing it. International aviation has been included in the EU ETS since the beginning of 2012.

51. **Industrial sector.** The industry sector is the one that most drastically reduced its CO<sub>2</sub> emissions (83.6 per cent for 1990–2016). The main instrument for reducing GHG emissions from industry in Bulgaria until 2020 is the EU ETS. National-level measures relate to higher energy efficiency in industry and use of alternative fuels, supported by the Energy Efficiency for Competitive Industry programme that provides low-interest loans to small and medium-sized enterprises. During the review, the ERT noted that there were no activities implemented during 2013–2016 for this measure.

(c) **Policies and measures in other sectors**

52. **Industrial processes.** The ERT noted that Bulgaria has not reported any measures targeting exclusively industrial processes emissions. The principal measure to mitigate emissions from industrial processes is the implementation of energy efficiency audits in industrial systems with annual energy consumption over 3,000 MWh, which is mainly for energy-related CO<sub>2</sub> but also includes emissions of HFCs and PFCs. The measure supports projects to install absorption chillers, refurbish boiler aggregates/boilers, improve thermal insulation and replace old boilers with condensing boilers, among other energy efficiency projects. The expected GHG emission reduction effect of the measure, including all CO<sub>2</sub>, HFC and PFC mitigation, is 119 kt CO<sub>2</sub> eq by 2020. During the review, Bulgaria provided the main results of the measure through the publication “First official report on the implementation of the third national action plan on climate change 2013–2020”. The report indicates that the Operational Programme for Development of the Competitiveness of the Bulgarian Economy 2007–2013 has financed projects whereby 465 enterprises have received a total of 328 million Bulgarian lev in grants to promote and develop energy efficiency and the green economy; and that the GHG emission reductions resulting from the supported projects amounted to approximately 126.60 kt CO<sub>2</sub> per year.

53. **Agriculture.** In 2016 the agriculture sector accounted for 11.1 per cent of the total annual national GHG emissions. Bulgaria has several measures to reduce emissions from the major sources in the sector. The measures are consistent with the national circumstances of the sector and the EU Common Agricultural Policy for 2014–2020. Thus, the opportunities for mitigation are linked to the implementation of direct payments, market support and rural development measures. The main implemented mitigation actions are encouraging the use of suitable crop rotation, expansion of the use of nitrogen-fixing crops and increasing the rate of land reclamation using herbaceous species typical for the region and soil treatment methods. Mitigation measures are planned and promoted by improving the knowledge of farmers regarding humus conservation activities (e.g. precise fertilization, green manure, liming, soil cultivation, prevention of stubble burning, anti-erosion measures). Mitigation measures targeting CH<sub>4</sub> emissions include encouraging extensive grassland husbandry, improving the management and use of manure and introducing low-carbon practices for processing manure (e.g. composting, transformation of manure into biogas under anaerobic conditions).

54. **LULUCF.** The limited potential for GHG mitigation is highlighted by the small estimated impact of all proposed measures, which is 9.1 kt CO<sub>2</sub> by 2020. Mitigation actions

focus on increasing carbon sequestration in all carbon pools across various land categories, both forests and non-forest land. The NC7 mentions that such activities also address other environmental concerns, namely, supporting biodiversity preservation (e.g. maintenance of forests of high conservation value) and combating land degradation. Actual mitigation actions on non-forest land are limited to the restoration and sustainable management of wetlands. Mitigation in forestry is well represented by afforestation/reforestation (i.e. increased areas of urban and suburban parks and green zones, anti-erosion afforestation) and forest management (e.g. restoration and maintenance of protective forest belts, conservation of carbon stocks in forests, increasing the potential of forests for carbon sequestration). Maintaining long-term carbon stocks in wood products is supported only through awareness campaigns for expanding the use of wood products to substitute products from non-renewable, polluting and energy-intensive materials. Actions in the forestry sector are supported technically and financially through the National Strategy for Development of the Forestry Sector for 2013–2020.

55. **Waste management.** Bulgaria is implementing, under EU legislation, waste management policies to reduce GHG emissions. The ERT noted that Bulgaria is making efforts to prevent waste and reduce the amount of waste going to landfill, while managing existing landfills. The main PaMs reported in the NC7 are focused on the capture and burning of biogas in all new and existing regional landfills; introducing anaerobic stabilization of sludge with management, capture and burning of biogas; and constructing installations for mechanical and biological treatment and treatment and recovery of compost and biogas. The total expected effect for the three main PaMs is 1,490 kt CO<sub>2</sub> eq by 2020.

**(d) Minimization of adverse impacts in accordance with Article 2 and Article 3, paragraph 14, of the Kyoto Protocol**

56. In the NC7 Bulgaria partially 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 (see issue 11 in table 11). Bulgaria stated in its NC7 that the implemented and planned PaMs have no adverse impact on developing countries.

57. Further information on how Bulgaria strives to implement its commitments under Article 3, paragraph 14, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties was reported in the 2018 annual submission. Bulgaria highlighted the indirect nature of the possible impacts of its policies on developing countries and the difficulty of attributing these impacts to separate policies or measures. Bulgaria considers that its application of the joint implementation mechanism in Bulgaria, aiming mostly at renewal of old technologies and improvement of energy efficiency, has no transboundary effects, nor does the implementation of the EU ETS or other policies and legislation transposed from the EU legislation and policies on climate change.

**(e) Assessment of adherence to the reporting guidelines**

58. The ERT assessed the information reported in the NC7 of Bulgaria and identified issues relating to completeness and transparency. The findings are described in table 11.

Table 11

**Findings on policies and measures, including those in accordance with Article 2 of the Kyoto Protocol, from the review of the seventh national communication of Bulgaria**

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement <sup>a</sup> specified in paragraph 13  Issue type: transparency  Assessment: recommendation	<p>The Party reported in its NC7 information on PaMs adopted to implement commitments under Article 4, paragraph 2(a) and (b), of the Convention. However, the PaMs in the energy, transport and industry sectors were not transparently described, and the specific measures were not clearly described. For example, in the measure “Increasing the share of electric energy from renewable energy sources in the electricity mix” the type of instrument is described as a “national action plan in the field of renewable energy” but there is no description of the measure that will lead to the increase in the share of renewable energy (e.g. incentives for adoption of renewable energy).</p> <p>During the review Bulgaria explained that relevant information is included in the third National Action Plan on Climate Change. For the energy sector it mentioned national programmes supporting innovations and clean energy technologies as well as regulatory incentives for energy network operators.</p> <p>The ERT recommends that Bulgaria provide in its next NC a transparent description of the PaMs adopted in the energy, transport and industry sectors to implement commitments under Article 4, paragraph 2(a) and (b), of the Convention, in order to ensure comprehensive understanding of how the PaMs are contributing to the mitigation of GHG emissions by including not only the objective of the measure but also details of the way in which this objective will be achieved.</p>
2	Reporting requirement <sup>a</sup> specified in paragraph 14  Issue type: completeness  Assessment: encouragement	<p>The Party did not report in its NC7 which PaMs are innovative and/or effectively replicable by other Parties.</p> <p>During the review Bulgaria provided information on how the different technologies implemented in the energy, industry and waste sectors contribute to the overall reduction of GHG emissions, while at the same time supporting increased productivity and resource efficiency. Bulgaria additionally explained that such information will be provided in its next NC. The ERT noted that this explanation does not fulfil the requirement of reporting on innovative and replicable PaMs.</p> <p>The ERT reiterates the encouragement made in the previous review report that Bulgaria include in the next NC complete information on PaMs that are innovative and/or effectively replicable by other Parties.</p>
3	Reporting requirement <sup>a</sup> specified in paragraph 15  Issue type: completeness  Assessment: encouragement	<p>The Party did not report in its NC7 on PaMs influencing GHG emissions from international transport in the transport sector. However, the information on activities aimed at promoting IMO and ICAO decisions are reported in the NC7 (section 4.6. on policies and measures pursuant to Article 2 of the Kyoto Protocol).</p> <p>During the review Bulgaria explained that it is difficult to isolate the effect of PaMs influencing international transport. Furthermore, in relation to maritime GHG emissions, Bulgaria stated that, as an EU member State, it follows and implements EU-wide policy. The main steps for reducing GHG emissions in the maritime sector are (1) monitoring, reporting and verification of CO<sub>2</sub> emissions from large ships using EU ports, (2) GHG reduction targets for the maritime transport sector and (3) further measures, including market-based measures, in the medium to long term.</p> <p>In relation to aviation emissions, Bulgaria informed the ERT that, as an EU member State, it is taking action to reduce aviation emissions in Europe and working with the international community to develop measures with global reach under aviation in the EU ETS and under the global scheme to offset emissions within the Carbon Offsetting and Reduction Scheme for International Aviation.</p> <p>The ERT reiterates the encouragement made in the previous review report that Bulgaria include, in its next NC, information on PaMs influencing GHG emissions from international transport in the transport sector, complementing the information reported elsewhere on ICAO and IMO.</p>

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
4	Reporting requirement <sup>a</sup> specified in paragraph 16  Issue type: completeness  Assessment: encouragement	<p>The Party did not report in its NC7 the actions taken to identify and periodically update its policies and practices which encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur.</p> <p>During the review Bulgaria explained that the main emission sources are identified on the basis of the trend of the GHG emissions provided by the national annual inventory. The assessment of the policies or measures that may increase GHG emissions and those that lead to a decrease of GHG emissions is made by the Inter-Ministerial Working Group on the National Action Plan on Climate Change and a national expert council on climate change.</p> <p>The ERT encourages Bulgaria to report in its next NC on the actions taken to identify and periodically update its policies and practices which encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur.</p>
5	Reporting requirement <sup>a</sup> specified in paragraph 17  Issue type: completeness  Assessment: encouragement	<p>The Party reported in textual format the cross-sectoral PaMs under section 4.1 of the NC7 but a table describing those cross-sectoral PaMs was not included.</p> <p>During the review Bulgaria explained that such a table could be provided in its next NC.</p> <p>The ERT reiterates the encouragement made in the previous review report that Bulgaria include complete information on cross-sectoral PaMs in both textual and tabular formats in the next NC.</p>
6	Reporting requirement <sup>a</sup> specified in paragraph 18  Issue type: completeness  Assessment: encouragement	<p>The Party reported the same set of PaMs as those previously reported in NC6 and no reference was made to this and the information was not focused on any alterations to the policy or measure, or effects achieved.</p> <p>During the review the Party provided a progress report on its first National Action Plan on Climate Change, from June 2017, which includes results and updated information on the PaMs reported in its NC7.</p> <p>The ERT encourages Bulgaria, if a policy or measure is maintained over time, to make a reference and provide a brief description in the next NC focusing on any alterations to the policy or measure or effects achieved.</p>
7	Reporting requirement <sup>a</sup> specified in paragraph 21  Issue type: completeness  Assessment: encouragement	<p>The Party reported that ExEA within MoEW performs monitoring of climate-related measures; however, it did not provide a description of the way in which the progress of PaMs to mitigate GHG emissions is monitored and evaluated over time.</p> <p>During the review, Bulgaria provided additional information within chapter 9 of its third National Action Plan on Climate Change, namely, the monitoring and reporting process under the plan, including timeliness, methods and responsibilities of the Interministerial Working Group on the National Action Plan on Climate Change.</p> <p>The ERT reiterates the encouragement made in the previous review report that Bulgaria provide in its next NC a description of the way in which progress with PaMs to mitigate GHG emissions is monitored and evaluated over time.</p>
8	Reporting requirement <sup>a</sup> specified in paragraph 23  Issue type: transparency	<p>The ERT noted the following differences between the textual section of the NC7 and table 4.19 regarding the estimate of the impacts of the individual PaMs:</p> <p>(a) The estimates of mitigation impacts in table 4.19 for measures 4, 5, 6, 9, 21, 22 and 31 are reported on an annual basis for the years 2020, 2025 and 2030, while in the text the impact is reported in an accumulated form by 2020. Although the numbers cannot be</p>

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
	Assessment: encouragement	<p>directly compared, in some cases the numbers reported for 2025 and 2030 for the measures are not corresponding or are not close to the average of the aggregated values;</p> <p>(b) The measure on page 167 of the NC7 “Encouraging the use of suitable crop rotation, especially with nitrogen fixing crops” expects higher emission reductions (6,356 kt CO<sub>2</sub> eq) than the estimated total GHG emissions from category 3 (agriculture) in the GHG inventory report in the NC7 for 2015 (6,236 kt CO<sub>2</sub> eq).</p> <p>During the review Bulgaria explained that:</p> <p>(a) The reported text of the aggregated estimated GHG emission reductions is for the whole reported period 2013–2020 (cumulative), whereas the reductions in table 4.19 are non-cumulative (i.e. annual for 2020, 2025 and 2030);</p> <p>(b) There has been a technical mistake in the units and the correct expected emission reductions of the measure are 6,356 t CO<sub>2</sub> eq. Additionally, the Party is planning to correct the text in the next submission of its NC.</p> <p>The ERT reiterates the encouragement made in the previous review report that Bulgaria improve transparency in its next NC by ensuring consistency between the textual section of the NC and tables regarding the estimate of the impacts of the individual PaMs.</p>
9	<p>Reporting requirement<sup>a</sup> specified in paragraph 24</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>For most of the PaMs the Party did not report information related to the costs of PaMs, the non-GHG mitigation benefits of PaMs and how the policy or measure interacts with other PaMs at the national level.</p> <p>During the review the Party provided information on how its reported PaMs are related at the national level to the third National Action Plan on Climate Change and informed the ERT of the interaction between the EU ETS and PaMs from the energy and industry sectors.</p> <p>The ERT encourages Bulgaria to provide in the next NC information about the costs of PaMs, the non-GHG mitigation benefits of PaMs and how the policy or measure interacts with other PaMs at the national level.</p>
10	<p>Reporting requirement<sup>a</sup> specified in paragraph 25</p> <p>Issue type: completeness</p> <p>Assessment: recommendation</p>	<p>In its NC7 the Party did not provide information about how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention.</p> <p>During the review, Bulgaria explained that it is difficult to identify the impacts on Bulgaria’s longer-term emission trends of the separate PaMs outlined in chapter 5 of the NC7. Additionally, the Party explained that the information presented in the NC7 is based on the sum of the projections as well as the impact of other factors (e.g. energy prices), which also drive changes in longer-term trends, and further provided information on some high-level effects in the energy, industrial processes, agriculture and waste sectors.</p> <p>The ERT reiterates the recommendation made in the previous review report that Bulgaria provide information in the next NC about how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention.</p>
11	<p>Reporting requirement<sup>b</sup> specified in paragraph 36</p> <p>Issue type: completeness</p> <p>Assessment: recommendation</p>	<p>The ERT noted that Bulgaria did not report information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects.</p> <p>During the review Bulgaria explained that the possible impacts on other Parties are mostly indirect and are difficult to be attributed to separate measures; and that assessment of the potential impact is required under the EU comprehensive impact assessment system that ensures the minimization of impacts on various stakeholders and third parties.</p> <p>The ERT recommends that Bulgaria report in its next NC information relating to how it is striving to implement policies under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects, especially on developing countries and in particular those identified in Article 4, paragraphs 8 and 9, of the Convention, taking into account Article 3 of the Convention.</p>

*Note:* The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

<sup>a</sup> Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs.

<sup>b</sup> Paragraph number listed under reporting requirement refers to the relevant paragraph of the reporting guidelines for supplementary information.

## **C. Projections and the total effect of policies and measures, including information on complementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol**

### **1. Projections overview, methodology and results**

#### **(a) Technical assessment of the reported information**

59. Bulgaria reported updated projections for 2020 and 2030 relative to actual inventory data for 2015 under the WEM scenario. The WEM scenario reported by Bulgaria includes implemented and adopted PaMs until 2015.

60. In addition to the WEM scenario, Bulgaria reported the WAM scenario. The WAM scenario includes planned PaMs adopted or planned after 2015. Bulgaria provided definitions of its scenarios, explaining that its WEM scenario includes PaMs specified in the third National Climate Change Plan, but measures specific to the WAM scenario were not well described in the NC7 (see issue 1 in table 15). The definitions indicate that the scenarios were prepared according to the UNFCCC reporting guidelines on NCs.

61. The projections are presented on a sectoral basis, using the same sectoral categories as those used in the reporting on mitigation actions, and on a gas-by-gas basis for CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFCs, HFCs and SF<sub>6</sub> (treating PFCs and HFCs collectively in each case) for 2015–2030 for the WEM scenario only. The projections are also provided in an aggregated format for each sector as well as for a Party total using global warming potential values from the IPCC Fourth Assessment Report.

62. Bulgaria did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides (see issue 3 in table 15).

63. Emission projections related to fuel sold to ships and aircraft engaged in international transport were not reported separately and were not included in the totals but were provided during the review (see issue 4 in table 15). Bulgaria reported on factors and activities affecting emissions for each sector.

#### **(b) Methodology, assumptions and changes since the previous submission**

64. The methodology used for the preparation of the projections is identical to that used for the preparation of the emission projections for the BR2 and NC6. Bulgaria reported supporting information further explaining the methodologies and the changes made since the NC6 and BR2. The methodologies and assumptions are identical to those used for the NC6 and BR2, except for some assumption adjustment due to a change in the starting point of the projections.

65. To prepare its projections, Bulgaria relied on key underlying assumptions in relation to GDP growth rate, population and energy prices of oil, gas and coal. These variables and assumptions, common to the WEM and WAM scenarios, were reported in CTF table 5. The key assumptions have not been updated since the NC6. The ERT noted that the annual GDP growth rate was assumed to be 4.3 per cent in 2020 and 2.8 per cent in 2030, despite the rather high annual rate of population decline, assumed to be –2.8 per cent in 2020 and –3.2 per cent in 2030.

66. Bulgaria provided information on methodologies, models and approaches used in the preparation of the projection scenarios (see issue 6 in table 15). During the review, the ERT confirmed the methodological steps as follows: (1) macroeconomic background (indicators) provided using the model of the Ministry of Finance as input for the following steps; (2) other

sector-specific assumptions separately prepared for the WEM and WAM scenarios on the basis of the definitions of the scenarios; (3) sector-specific models prepared using country-specific inputs (for the most important energy-related sectors, the bottom-up LEAP software is used for modelling, while simpler spreadsheet models are constructed for other sectors); (4) sector-wise outputs of the models are aggregated. The interference between sectors is not modelled.

67. Sensitivity analyses were conducted for GDP growth rate (see issue 9 in table 15). The ERT calculated, based on the information provided during the review, that a higher GDP growth case (additional 3.7 per cent/year) results in higher GHG emissions of 3.7 per cent/year and vice versa, which implies that the elasticity of GHG emissions against additional GDP growth is almost one, or the emission reduction effect is almost independent of GDP growth.

### (c) Results of projections

68. The projected emission levels under different scenarios and information on the Kyoto Protocol targets and the quantified economy-wide emission reduction target are presented in table 12 and the figure below.

Table 12

#### Summary of greenhouse gas emission projections for Bulgaria

	<i>GHG emissions (kt CO<sub>2</sub> eq per year)</i>	<i>Changes in relation to base-year<sup>a</sup> level (%)</i>	<i>Changes in relation to 1990 level (%)</i>
Quantified economy-wide emission reduction target under the Convention <sup>b</sup>	NA	NA	NA
Inventory data 1990 <sup>c</sup>	103 653.58	NA	NA
Inventory data 2015 <sup>c</sup>	61 482.76	-40.7	-40.7
WEM projections for 2020 <sup>c</sup>	59 086.83	-43.0	-43.0
WAM projections for 2020 <sup>c</sup>	53 325.50	-48.6	-48.6
WEM projections for 2030 <sup>c</sup>	55 492.74	-46.5	-46.5
WAM projections for 2030 <sup>c</sup>	49 826.80	-51.9	-51.9

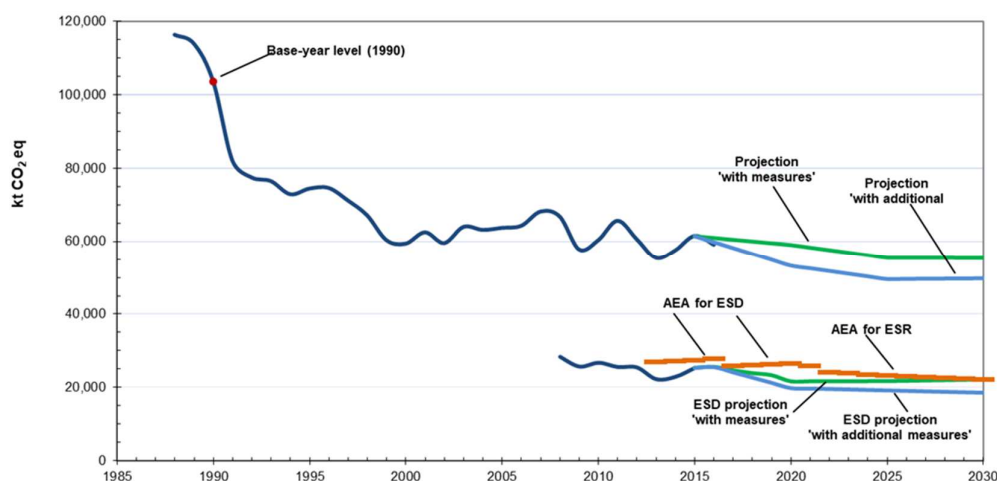
<sup>a</sup> "Base year" in this column refers to the base year used for the target under the Convention, which for Bulgaria is 1990.

<sup>b</sup> The quantified economy-wide emission reduction target under the Convention is a joint target of the EU and its 28 member States. The target is to reduce emissions by 20 per cent compared with the base-year (1990) level by 2020.

<sup>c</sup> From Bulgaria's CTF table 6 provided during the review.



## Greenhouse gas emission projections reported by Bulgaria



Sources: (1) data for 1990–2016: Bulgaria’s 2018 annual inventory submission, version 1; total GHG emissions excluding LULUCF; (2) data for 2015–2030: Bulgaria’s NC7 and BR3; total GHG emissions excluding LULUCF; updated projections provided by the Party during the review; (3) AEAs for ESR (2021–2030) from the EEA report *Trends and Projections Europe 2018: Tracking Progress Towards Europe’s Climate and Energy Targets*, based on the WEM projections.

69. Bulgaria’s total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 59,068.83 and 55,492.74 kt CO<sub>2</sub> eq, respectively, under the WEM scenario, which represents a decrease of 43.0 and 46.5 per cent, respectively, below the 1990 level. Under the WAM scenario, emissions in 2020 and 2030 are projected to be lower than those in 1990 by 48.6 and 51.9 per cent and amount to around 53,325.50 and 49,826.80 kt CO<sub>2</sub> eq, respectively. The 2020 projections suggest that Bulgaria will continue contributing to the achievement of the EU target under the Convention.

70. Bulgaria’s target for non-ETS sectors is to limit its emission growth to 20 per cent above the 2005 level by 2020. Bulgaria’s AEAs, which correspond to its national emission target for non-ETS sectors, change linearly from 26,933.22 kt CO<sub>2</sub> eq in 2013 to 26,543.23 kt CO<sub>2</sub> eq for 2020. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 21,741.58 kt CO<sub>2</sub> eq by 2020. Under the WAM scenario, Bulgaria’s emissions from non-ETS sectors in 2020 are projected to be 19,730.46 kt CO<sub>2</sub> eq. The projected levels of emissions under the WEM and WAM scenarios are 18.1 and 25.7 per cent, respectively, below the AEA for 2020. The ERT noted that this suggests that Bulgaria expects to meet its ESD target under both the WEM and the WAM scenario.

71. Bulgaria presented the WEM and WAM scenarios by sector for 2020 and 2030, as summarized in table 13.

Table 13  
Summary of greenhouse gas emission projections for Bulgaria presented by sector

Sector	GHG emissions and removals (kt CO <sub>2</sub> eq)					Change (%)			
	1990	2020		2030		1990–2020		1990–2030	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
Energy (not including transport)	66 899.02	36 849.33	34 273.00	34 118.94	31 505.00	–44.9	–48.8	–49.0	–52.9
Transport	6 572.96	8 354.00	6 664.00	7 335.00	5 893.00	27.1	1.4	11.6	–10.3

Sector	GHG emissions and removals (kt CO <sub>2</sub> eq)				Change (%)				
	1990	2020		2030	1990–2020		1990–2030		
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
Industrial processes	10 046.88	4 829.50	4 829.50	4 900.80	4 900.80	-51.9	-51.9	-51.2	-51.2
Agriculture	12 127.18	5 065.00	5 005.00	5 454.00	5 391.00	-58.2	-58.7	-55.0	-55.5
LULUCF	-15 023.33	-11 209.00	-10 104.00	-12 265.00	-6 019.00	-25.4	-32.7	-18.4	-59.9
Waste	8 007.54	3 989.00	2 554.00	3 684.00	2 137.00	-50.2	-68.1	-54.0	-73.3
Other (specify)	NO	NO	NO	NO	NO	NA	NA	NA	NA
<b>Total GHG emissions without LULUCF</b>	<b>103 653.58</b>	<b>59 086.83</b>	<b>53 325.50</b>	<b>55 492.74</b>	<b>49 826.80</b>	<b>-43.0</b>	<b>-48.6</b>	<b>-46.5</b>	<b>-57.2</b>

Source: Bulgaria's BR3 CTF table 6 provided during the review.

72. According to the projections reported for 2020 under the WEM scenario, the most significant emission reductions are expected to occur in the energy sector not including transport, amounting to a projected reduction of 30,049.69 kt CO<sub>2</sub> eq (44.9 per cent), followed by the agriculture sector (7,062.18 kt CO<sub>2</sub> eq or 58.2 per cent), the industrial processes sector (5,217.38 kt CO<sub>2</sub> eq or 51.9 per cent) and the waste sector (4,018.54 kt CO<sub>2</sub> eq or 50.2 per cent), in 1990–2020. The ERT noted that only emissions from the transport sector are projected to increase, by 1,781.04 kt CO<sub>2</sub> eq or 27.1 per cent, in that period. The pattern of projected emissions reported for 2030 under the same scenario remains the same. The ERT also noted that the reductions occurred mainly before 2000 and the total emissions have remained almost stable thereafter (-0.5 per cent and -6.5 per cent for 2000–2020 and 2000–2030, respectively), dominated by the energy sector without transport. The emission reductions prior to 2000 were due to the shrinking, reflected in reduced energy consumption, of the majority of the economic sectors, except for the transport sector. Despite this tendency towards stabilization of total emissions but increasing emissions from the transport sector, under the WEM scenario emissions from the transport sector are projected to decrease considerably after 2015, probably as a result of transport demand declining with the population.

73. If additional measures are considered (i.e. under the WAM scenario), the patterns of emission reductions by 2020 presented by sector remain the same with additional and constant emission reductions (5.6 per cent in 2020 and 5.5 per cent in 2030). The ERT noted that the decreasing emission trends for the transport and waste sectors are enhanced under the WAM scenario owing to the additional measures considered.

74. Bulgaria presented the WEM scenario by gas for 2020 and 2030, as summarized in table 14.

Table 14  
Summary of greenhouse gas emission projections for Bulgaria presented by gas

Gas	GHG emissions and removals (kt CO <sub>2</sub> eq)				Change (%)				
	1990	2020		2030	1990–2020		1990–2030		
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
CO <sub>2</sub>	78 650.47	56 111.80	NE	51 809.89	NE	-28.7	NA	-34.1	NA
CH <sub>4</sub>	16 179.06	6 936.71	NE	6 774.91	NE	-57.1	NA	-58.1	NA
N <sub>2</sub> O	8 820.36	3 928.66	NE	4 087.86	NE	-55.5	NA	-53.7	NA
HFCs	NO	437.82	NE	124.45	NE	NA	NA	NA	NA

Gas	GHG emissions and removals (kt CO <sub>2</sub> eq)				Change (%)				
	1990	2020		2030		1990–2020		1990–2030	
		WEM	WAM	WEM	WAM	WEM	WAM	WEM	WAM
PFCs	NO	2.08	NE	3.25	NE	NA	NA	NA	NA
SF <sub>6</sub>	NO	NO	NO	NO	NO	NA	NA	NA	NA
NF <sub>3</sub>	3.69	22.50	NE	26.40	NE	509.1	NA	615.4	NA
<b>Total GHG emissions without LULUCF</b>	<b>103 653.58</b>	<b>67 439.47</b>	<b>53 325.50</b>	<b>62 826.76</b>	<b>49 826.80</b>	<b>-43.0</b>	<b>-48.6</b>	<b>-46.5</b>	<b>-51.9</b>

Source: Bulgaria's BR3 CTF table 6 provided during the review.

75. For 2020 the most significant reductions are projected for CO<sub>2</sub> emissions (22,538.67 kt CO<sub>2</sub> eq (28.7 per cent)), followed by CH<sub>4</sub> (9,242.35 kt CO<sub>2</sub> eq (57.1 per cent)) and N<sub>2</sub>O (4,891.69 kt CO<sub>2</sub> eq (55.5 per cent)) between 1990 and 2020.

76. The projections by gas until 2030 under the WEM scenario are dominated by stronger reductions in CO<sub>2</sub> (with an additional 5.4 per cent reduction projected for 2020–2030), while total emissions are expected to decrease by an additional 3.5 per cent in the same period.

77. Bulgaria did not provide projections by gas for the WAM scenario.

#### (d) Assessment of adherence to the reporting guidelines

78. The ERT assessed the information reported in the NC7 of Bulgaria and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 15.

Table 15

#### Findings on greenhouse gas emission projections reported in the seventh national communication of Bulgaria

No.	Reporting requirement, issue type and assessment	Description of the finding with recommendation or encouragement
1	Reporting requirement specified in paragraph 29  Issue type: transparency  Assessment: encouragement	It was not made clear in the NC7 which planned PaMs were considered in the WAM scenario, and whether existing PaMs (such as in the energy supply sector) were to be further enhanced under a WAM scenario.  During the review, Bulgaria explained how the projections were made, especially for the WEM scenario, which reflects the TNAPCC and its methodological approach, but did not clearly explain which PaMs were included in the WAM scenario.  The ERT encourages Bulgaria to clarify in its next NC which planned PaMs were considered under the WAM scenario. The ERT noted that historically, GHG emissions, such as those related to the growth in the transport sector, have been compensated by the decline in the industry sector, while other sectors' emissions have been almost stable. Recognizing that the transport sector is key the ERT found that the WEM and WAM scenarios show a large shift in this sector's emissions, from a strong growing trend to a decreasing trend (especially for the WAM scenario), but the underlying reasons (e.g. which planned PaMs were considered) are not clear.
2	Reporting requirement specified in paragraph 35  Issue type: completeness  Assessment: recommendation	Bulgaria did not report projections by gas under the WAM scenario in its NC7. Furthermore, CTF table 6(c) includes erroneous inputs for historical emissions for "Total with and without LULUCF" as well as an unclear custom footnote. In addition, CTF table 6(a) for the WEM scenario has erroneous inputs for "Total without LULUCF" for 2020 and 2030.  Bulgaria provided corrected CTF tables, although without WAM projections by gas, during the review.

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
		<p>The ERT recommends that Bulgaria present its WAM projections on a gas-by-gas basis and provide correct figures in CTF tables 6(a) and (c) in its next submission.</p>
3	<p>Reporting requirement specified in paragraph 35</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>Bulgaria did not report projections of the indirect GHGs carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides.</p> <p>During the review, Bulgaria explained that it did not estimate such projections for its NC7. It plans to report projections of indirect GHGs in its next NC.</p> <p>The ERT encourages Bulgaria to report in its next NC projections of indirect GHGs.</p>
4	<p>Reporting requirement specified in paragraph 36</p> <p>Issue type: completeness</p> <p>Assessment: recommendation</p>	<p>Bulgaria did not report emission projections related to fuel sold to ships and aircraft engaged in international transport in its NC7.</p> <p>During the review, Bulgaria informed the ERT that the expected emissions from international fuels are 792.81, 790.44, 788.09 and 785.75 kt CO<sub>2</sub> eq for 2020, 2025, 2030 and 2035, respectively.</p> <p>The ERT reiterates the recommendation made in the previous review report that Bulgaria report in its next NC emissions related to fuel sold to ships and aircraft engaged in international transport, to the extent possible, separately and not included in the totals.</p>
5	<p>Reporting requirement specified in paragraph 38</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>Bulgaria did not include graphs showing the projected scenarios aggregated for all sectors and by gas in its NC7, although it included individual sectoral graphs.</p> <p>During the review, Bulgaria provided aggregated graphs.</p> <p>The ERT encourages Bulgaria to report in its next NC diagrams illustrating its projections in an aggregated format for all sectors and by gas. The ERT noted that relevant analysis and explanations pointing out specific parts of the graph could enhance the transparency of the reporting. The ERT also noted that the disaggregated graph showing EU ETS and ESD emission projections, which Bulgaria provided during the review, could be useful to explain its EU- and country-driven approach to mitigating climate change.</p>
6	<p>Reporting requirement specified in paragraph 42</p> <p>Issue type: transparency</p> <p>Assessment: encouragement</p>	<p>Bulgaria reported on its methodological approach but the relationship between several tools within the model, as well as the model inputs and outputs, was unclear.</p> <p>During the review, Bulgaria explained the methodological steps as described in paragraph 66 above.</p> <p>The ERT encourages Bulgaria to report in its next BR/NC clear information to facilitate a basic understanding of the models and/or approaches used.</p>
7	<p>Reporting requirement specified in paragraph 43</p> <p>Issue type: completeness</p> <p>Assessment: encouragement</p>	<p>Bulgaria did not report the elements described in paragraph 43 of the UNFCCC reporting guidelines on NCs (e.g. strengths and weaknesses of the model and the approach to overlaps or synergies between different PaMs), which would make the description of the model or approach more transparent.</p> <p>During the review, Bulgaria did not provide further information, for example on strengths and weaknesses of the model and the approach to overlaps or synergies between different PaMs.</p> <p>The ERT encourages Bulgaria to report in its next NC all the elements mentioned in paragraph 43 of the UNFCCC reporting guidelines on NCs (e.g. for which gases and/or sectors the model or approach was used, the type of model or approach used and its characteristics, the original purpose for which the model or approach was designed, the strengths and weaknesses of the model and how the model or approach used accounts for any overlaps or synergies between different PaMs).</p>
8	<p>Reporting requirement specified in paragraph 45</p>	<p>Bulgaria did not report the main differences between the assumptions and methods used for the NC7 and those used for previous NCs.</p>

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
	Issue type: completeness  Assessment: encouragement	<p>During the review, Bulgaria explained that the assumptions and methods applied were identical to those used for the NC6, except for some assumption adjustment due to a change in the starting point of the projections. Bulgaria stated that it intends to use more integrated methods for its next NC.</p> <p>The ERT encourages Bulgaria to describe how the methods and assumptions used for its NC are different from those used for previous NCs. For example, it should clarify the differences in GHG emissions calculated by the different methods or assumptions. Sensitivity analysis of previous and new methods could clarify differences in characteristics.</p>
9	Reporting requirement specified in paragraph 46  Issue type: completeness  Assessment: encouragement	<p>Bulgaria reported in its NC7 a sensitivity analysis focused on GDP growth, but it did not include a qualitative or, where possible, a quantitative discussion of the results.</p> <p>During the review, Bulgaria identified several elements that could influence the projections, such as the introduction of a new nuclear power plant and stated that it plans to include in its next submission additional factors that significantly affect GHG emissions.</p> <p>The ERT encourages Bulgaria to discuss in its next NC the sensitivity of the projections to underlying assumptions qualitatively, and, where possible, quantitatively.</p>
10	Reporting requirement specified in paragraph 48  Issue type: completeness  Assessment: encouragement	<p>The Party reported factors to understand the emission trends in the past and in future projections in several sections of its NC7 but not in tabular format.</p> <p>During the review, Bulgaria provided several documents that include the relevant analyses (National Energy Strategy 2020; reference scenarios for 2016; and online operational data from the national energy system operator) but did not present the information in a tabular format.</p> <p>The ERT encourages Bulgaria to report in tabular format factors that can explain emission trends. For example, the ERT noted that historically, Bulgaria has experienced substantial and continuous improvement in the energy intensity of GDP, especially in the period of strong economic growth (–5.1 per cent/year for 1999–2008), while even in the economically stagnant period the ERT observed a considerable improvement in the range of –2 to –3 per cent/year. This improvement could probably be largely attributed to the structural changes in the economy. One such factor could be the improved technological efficiency. Factorization or decomposition of the reasons underlying emission trends can provide useful insights when designing/strengthening the PaMs.</p>

*Note:* Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs and on BRs.

## 2. Assessment of the total effect of policies and measures

### (a) Technical assessment of the reported information

79. In the NC7 Bulgaria presented the estimated and expected effect of implemented and adopted PaMs individually, but an aggregated effect was not provided. During the review Bulgaria provided the total effect of PaMs for all sectors, except transport, in 2020 and 2030 in tabular format. The ERT noted that the figures provided are more than five times greater than the sum of the effect of each policy or measure shown in the NC7.

80. Bulgaria reported that the total estimated effect of its adopted and implemented PaMs is 38,632.50 kt CO<sub>2</sub> eq. According to the information reported in the NC7, PaMs implemented in the energy sector will deliver the largest emission reductions, followed by PaMs implemented in the waste and industry sectors. Table 16 provides an overview of the total effect of PaMs as provided during the review. Bulgaria also provided the figures from the “First official report on the implementation of the TNAPCC 2013–2020”, which mentioned that the estimated were much greater than the expected emission reductions set out in the TNAPCC, especially for the energy supply sector. The ERT found large discrepancies (e.g. in the industry sector) between the progress report outcomes and the figures expected in 2020/2030. The ERT considers that these

may be due to the different estimation methods used. The Party did not provide any explanation of this issue.

Table 16

**Projected effects of Bulgaria's planned, implemented and adopted policies and measures by 2020 and 2030**

Sector	2016	2020		2030	
	<i>Effect of implemented and adopted measures (kt CO<sub>2</sub> eq)</i>	<i>Effect of implemented and adopted measures (kt CO<sub>2</sub> eq)</i>	<i>Effect of planned measures (kt CO<sub>2</sub> eq)</i>	<i>Effect of implemented and adopted measures (kt CO<sub>2</sub> eq)</i>	<i>Effect of planned measures (kt CO<sub>2</sub> eq)</i>
Energy supply	8 083.71	17 980.00	NA	18 159.80	NA
Household and service	283.67	2 965.32	NA	2 994.97	NA
Industry	126.60	5 658.00	NA	5 714.58	NA
Transport	657.98	NA	NA	NA	NA
Agriculture	310.99	28.95	NA	29.24	NA
LULUCF	54.67	80.76	NA	81.57	NA
Waste management	542.92	11 919.47	NA	12 038.67	NA
<b>Total</b>	<b>10 060.54</b>	<b>38 632.50</b>	<b>NA</b>	<b>39 018.82</b>	<b>NA</b>

*Source:* Information provided by Bulgaria during the review. 2016 figures are from the “First official report on the implementation of the third national action plan on climate change 2013–2020”.

**(b) Assessment of adherence to the reporting guidelines**

81. The ERT assessed the information reported in the NC7 of Bulgaria and identified an issue relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 17.

Table 17

**Findings on the assessment of the total effect of policies and measures from the review of the seventh national communication of Bulgaria**

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 39  Issue type: completeness  Assessment: recommendation	Bulgaria provided in its NC7 the estimated and expected effect of each of its implemented and adopted PaMs but did not provide aggregated values.  During the review, Bulgaria reported the information provided in table 16.  The ERT recommends that Bulgaria provide in its next NC the estimated and expected total effect of implemented and adopted PaMs.
2	Reporting requirement specified in paragraph 40  Issue type: completeness  Assessment: recommendation	Bulgaria did not provide an estimate of the total effect of its PaMs in accordance with the WEM scenario compared with a situation without such PaMs.  During the review, Bulgaria provided information by sector as presented in table 16.  The ERT recommends that Bulgaria provide an estimate of the total effect of its PaMs in accordance with the WEM scenario compared with a situation without such PaMs, presented in terms of GHG emissions avoided by gas in a tabular format.
3	Reporting requirement specified in paragraph 41	It is not evident from its NC7 how Bulgaria calculated the total effects of its PaMs. The ERT noted that there are significant discrepancies between the

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
	Issue type: transparency	estimated emission reductions and the expected effects (in total as well as by sector, as shown in Table 16).
	Assessment: encouragement	During the review no explanation of the discrepancies was provided by Bulgaria.  The ERT encourages Bulgaria to provide an explanation of the method used to calculate the total effects of its PaMs. The ERT noted that the analysis of estimated and expected progress and the comparison between the WEM and the WAM scenario would also provide useful information and insights for the design of future PaMs and projections.

*Note:* Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

### **3. Supplementary relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol**

#### **(a) Technical assessment of the reported information**

82. In the NC7 Bulgaria provided information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is supplemental to domestic action. The ERT noted that the Party does not plan to use the market-based mechanisms to meet its Kyoto Protocol target.

#### **(b) Assessment of adherence to the reporting guidelines**

83. The ERT assessed the information reported in the NC7 of Bulgaria and recognized that the reporting is complete, transparent and adhering to the reporting guidelines for supplementary information. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

### **D. Provision of financial and technological support to developing country Parties, including information under Articles 10 and 11 of the Kyoto Protocol**

84. Bulgaria is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, the Party provided some information in its BR3 on its provision of support to developing country Parties.

85. Bulgaria reported that in 2015 it announced its grant contribution of EUR 100,000 to the Green Climate Fund. The Party also reported on its activities related to technology transfer, but in terms of receiving rather than providing support. As a new EU member State, Bulgaria is a recipient of technology transfer support and uses various EU funds to help it to comply with certain environmental standards and to implement improved environmental policy.

### **E. Vulnerability assessment, climate change impacts and adaptation measures**

#### **1. Technical assessment of the reported information**

86. In the NC7 Bulgaria provided the required information on the expected impacts of climate change in the country; the adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities and considerations; and an outline of the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation. The Party provided a description of climate change vulnerability and impacts in relation to the agriculture, forestry and water resources sectors and highlighted the adaptation response

actions taken and planned at different levels of government. During the review, Bulgaria provided additional information covering more sectors, such as energy, transport, biodiversity and ecosystems, urban environment, human health and tourism.

87. Located on the Balkan Peninsula in South-Eastern Europe, Bulgaria has unusually varied climate conditions due to the influence of the two very different continental and Mediterranean climates and its diverse landscape. Bulgaria's climate became not only warmer but also drier at the end of the twentieth century and is expected to change significantly over the coming decades as a result of changes in annual air temperature and precipitation, decreased snow cover persistence and increased weather and climate extremes.

88. Bulgaria reported on its assessment of expected impacts and vulnerability based on projected changes in mean surface air temperature, precipitation and extreme weather events in 2050 and 2080 and at the end of the twenty-first century. Different climate change scenarios were developed using global and regional climate model simulations as part of the Climate Change and Variability: Impact on Central and Eastern Europe and Central and Eastern Europe Climate Change Impact and Vulnerability Assessment projects. For Bulgaria, the climate scenarios indicate significant warming from the middle to the end of the twenty-first century, with warmer summers, milder winters and an increase in ice-free days; as well as increased risk of and vulnerability to soil drought in the twenty-first century, with soils with low moisture retention and regions in south-east Bulgaria with low precipitation during the warm season being the most vulnerable.

89. Bulgaria reported that most of its adaptation PaMs are implemented under the coordination and responsibility of MoEW and cover sectors such as agriculture, water, urban environment, energy, transport, construction and infrastructure, forestry, ecosystems and biodiversity, human health and tourism.

90. Impetus has been given to addressing adaptation matters with the National Climate Change Adaptation Strategy, which extends to 2030 and is expected to be adopted in 2019. During the review, Bulgaria explained that the adoption of the Strategy has been delayed as it is still under review. The development of the Strategy is to be completed in two phases. The first phase, a framework document (National Climate Change Risk and Vulnerability Assessment for the Sectors of the Bulgarian Economy) was finalized in early June 2014 – it serves as the basis for the development of the National Climate Change Adaptation Strategy and assesses the risk of climate change related natural disasters in Bulgaria on the basis of various climate models and scenarios. The economic sectors included are agriculture, water, urban environment, energy, transport, construction and infrastructure, ecosystems and biodiversity, human health and tourism. The second phase is the preparation and adoption of a National Climate Change Adaptation Strategy and Action Plan. The Strategy will provide analysis of the current situation in the covered sectors, set goals and priorities for improving adaptation capacity by sector and define specific measures to achieve the goals set out in the Strategy. The Action Plan will summarize the adaptation measures for all sectors identified in the Strategy.

91. MoEW signed an agreement with the International Bank for Reconstruction and Development for Reimbursable Advisory Services for the development of its National Climate Change Adaptation Strategy and Action Plan. The agreement aims to support MoEW in accessing options for addressing climate risks across the economy, formulating its National Climate Change Adaptation Strategy and Action Plan and strengthening national capacity for the implementation and cross-sector coordination of climate change adaptation. The development of the Strategy is funded by the Bulgarian Operational Programme “Good Governance” under priority axis 2, “Effective and professional governance in partnership with civil society and business”, through a grant contract signed between MoEW and the Managing Authority of the Operational Programme in April 2017. The Strategy will include a section on insurance to highlight the importance of insurance for managing risks related to climate change and the development of adaptation measures. Table 18 summarizes the information on vulnerability and adaptation to climate change presented in the NC7 of Bulgaria.



Table 18

**Summary of information on vulnerability and adaptation to climate change reported by Bulgaria**

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Agriculture and food security	<p><i>Vulnerability:</i> Increase in drought severity and decrease in annual precipitation, which will affect the productivity of agricultural crops, including spring agricultural crops, crops cultivated on infertile soils and crops on non-irrigated areas and arable lands in south-east Bulgaria.</p> <p><i>Adaptation:</i> Supporting and sustaining agricultural production and minimizing the impact of climate change by reducing the vulnerability of agricultural crops by developing new cultivars and hybrids, changing the sowing dates of spring crops to increase productivity, improving water management efficiency in the irrigation systems, using rational irrigation regimes for irrigated crops and new zoning of agroclimatic resources and agricultural crops. In addition, optimizing soil treatment by optimizing sowing dates, soil monitoring and improvement of the watering, mineral content and structure of soils, and applying phytosanitary measures for plant protection.</p>
Forests	<p><i>Vulnerability:</i> Deterioration of forest soil characteristics, stress in the forest ecosystems, changes in forest vegetation, moisture deficit affecting the productivity and sustainability of the forest ecosystems and watersheds, especially at lower altitudes, drastic warming and drought, and increased incidence of forest fires.</p> <p><i>Adaptation:</i> Planned felling of young plantations and establishment of new forests and plantations, improving forest sustainability for the forests in the low-lying parts of the country, afforestation of non-agricultural lands by increasing the forest cover, restoration of forest capacity and implementation of preventive activities.</p>
Soils	<p><i>Vulnerability:</i> Temperature rise will increase water deficit in drought-prone soils, especially soils with low moisture preservation capacity in south-east Bulgaria. In addition, about 30 per cent of the soils in Bulgaria will be vulnerable to wind erosion.</p> <p><i>Adaptation:</i> Selection of optimal dates for harvesting major crops, soil monitoring, improvement of soil water content and structure, use of modern technologies for preserving soil moisture, effective use of mineral fertilizers and action to minimize and control erosion.</p>
Water resources	<p><i>Vulnerability:</i> Decreased annual river run-off likely during this century, arising from the observed trends in warming and rainfall deficit and deterioration of water quality and water ecosystems.</p> <p><i>Adaptation:</i> Synchronizing planning periods between water and sanitation support organizations, providing research support to river basin directorates under framework agreements, upgrading precipitation, water resources and use monitoring networks, establishing a dynamic, publicly available geographic information systems database and assessing the adaptive capacity of the water infrastructure.</p>
Energy	<p><i>Vulnerability:</i> Damage to infrastructure (due to flooding, ice, land instability), availability and temperature of cooling water, shift in energy demand (due to extreme temperatures and weather events), uncertainty of power generation from renewables, reduced coal quality, heat stress for outdoor workers, increase in invasive species and reduced efficiency of power generation.</p> <p><i>Adaptation:</i> Reviewing awareness of climate change adaptation among energy sector stakeholders and delivering training, mainstreaming climate change considerations within energy sector policies and plans, developing financial mechanisms for building resilience, incorporating climate resilience into design and engineering, developing maps showing climate risk zones, developing regional interconnections and regional electricity trading, and motivating end users to implement energy saving measures.</p>
Transport	<p><i>Vulnerability:</i> Infrastructure damage from floods, landslides, overheating, icing of signalling/telecommunications equipment, low flows of inland waterways, road pavement deterioration, transport overload, material damage, traffic limitation, longer travel times, higher accident risk and higher travel and operation costs.</p> <p><i>Adaptation:</i> Improving adaptation-related data collection, developing guidelines on considering climate change adaptation in the project management cycle, implementing a programme to strengthen the road and railway networks' resilience to extreme weather</p>

<i>Vulnerable area</i>	<i>Examples/comments/adaptation measures reported</i>
Biodiversity and ecosystems	<p>events, updating the guidelines for the design of culverts for roads and railways, and raising public awareness regarding transport-related climate change adaptation issues.</p> <p><i>Vulnerability:</i> Loss of biodiversity, distortion of life cycles and phenology, regime shift, invasive species, competition for resources, increase in ecosystem vulnerability, decrease in ecosystem services, and hazards to human health and well-being.</p> <p><i>Adaptation:</i> Developing the new Biodiversity Strategy and Action Plan and Green Infrastructure Strategy, creating a carbon fund for environment and interdisciplinary teams and centres of excellence, organizing the targeted collection of folk customs and traditional knowledge, promoting ‘ecosystem thinking’ among volunteers and conducting training at all educational levels on restoring ecosystems.</p>
Urban environment	<p><i>Vulnerability:</i> Increased demand versus available water resources, effects on health (urban ‘heat island effect’), shift in energy consumption, disruption of infrastructure, traffic and electricity supply, sewage system overflow and damage to buildings and other properties.</p> <p><i>Adaptation:</i> Mainstreaming climate change adaptation into policies, strategies and legislation of regional and spatial/urban planning, improving construction and maintenance supervision, monitoring and control, supporting creative urban design that is resilient to climate change, promoting green, smart and innovative buildings and creating common standards for the type, structure, scope and format of metadata and data to harmonize with the EU at the city level.</p>
Human health	<p><i>Vulnerability:</i> Temperature- and emergency-related health effects, vector-, food-, water- and air-borne diseases, and cardiovascular and mental health/neurological disorders.</p> <p><i>Adaptation:</i> Reviewing existing plans, programmes, legislation and codes related to climate change impacts, establishing an interdisciplinary working group on climate change and human health, reviewing climate change related infrastructure and equipment, including climate change and human health in educational curricula, establishing a national climate change and human health monitoring system, designing public places with protection against extreme weather and updating the register of social groups vulnerable to climate change.</p>
Tourism	<p><i>Vulnerability:</i> Changing weather conditions and extreme events leading to decreased winter tourism and number of tourists, reduced availability of water and energy in tourism destinations and degradation of tourism destinations.</p> <p><i>Adaptation:</i> Developing insurance and risk management programmes, developing awareness-raising and training courses for the tourism business sector, developing tourist brochures and promoting national tourist sights and routes via social media, reconstructing tourist routes, improving tourist infrastructure, creating tourism indicators to monitor their sensitivity to climate change, developing new types of tourism, such as ecotourism, and implementing new marketing strategies and approaches for developing the sector.</p>

92. Bulgaria has not been involved in bilateral cooperation with developing countries on adaptation.

**2. Assessment of adherence to the reporting guidelines**

93. The ERT assessed the information reported in the NC7 of Bulgaria and identified an issue relating to transparency and adherence to the UNFCCC reporting guidelines on NCs. The finding is described in table 19.

Table 19  
**Findings on vulnerability assessment, climate change impacts and adaptation measures from the review of the seventh national communication of Bulgaria**

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 49	In the NC7 it was not clear whether Bulgaria used the <i>IPCC Technical Guidelines for Assessing Climate Change Impacts and Adaptations</i> and the United Nations

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
	<p>Issue type: transparency</p> <p>Assessment: encouragement</p>	<p>Environment Programme <i>Handbook on Methods for Climate Change Impact Assessment and Adaptation Strategies</i>.</p> <p>During the review, Bulgaria explained that its National Climate Change Adaptation Strategy and Action Plan follow the Party's principles and methodology for strategic planning and take into consideration, to the extent possible, the European Commission's guidelines on developing adaptation strategies and the European Climate Adaptation Platform Climate-ADAPT.</p> <p>The ERT encourages Bulgaria to use the above-mentioned IPCC guidelines and United Nations Environment Programme handbook. The ERT noted that, in order to increase reporting transparency, it would be useful for the Party to include in its next NC the information provided during the review with regard to the guidelines it used for reporting on climate change impacts and adaptation.</p>

*Note:* Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

## F. Research and systematic observation

### 1. Technical assessment of the reported information

94. Bulgaria provided information on its general policy and funding relating to research and systematic observation and on both domestic and international activities, including its contributions to the World Climate Programme, the International Geosphere-Biosphere Programme, the Global Climate Observing System and the IPCC. In accordance with the UNFCCC reporting guidelines on NCs, Bulgaria provided a summary of information on its Global Climate Observing System activities. The Party did not provide information on the identification of opportunities for and barriers to free and open international exchange of data and information and on action taken to overcome such barriers (see issue 2 in table 20).

95. Bulgaria has implemented and planned international and domestic policies and programmes on climate change research, systematic observation and climate modelling that aim to advance capabilities to predict and observe the physical, chemical, biological and human components of the Earth's system over space and time. Research-related activities in Bulgaria focus mainly on climate variability and change; vulnerability assessment and adaptation of individual sectors to climate change; solar-terrestrial influences; meteorology, climatology and hydrology; air pollution; climate-related technologies; territorial structure; and transport.

96. The Bulgarian Academy of Sciences carries out climate change research activities, both nationally and in cooperation with research organizations from other countries. NIMH is the Academy's main unit focusing on climate change research. The Scientific Coordination Centre for Global Change of the Academy, a consultative and advisory body of the Steering Committee of the Academy, organizes and conducts national and international research activities and projects related to climate change and global change. Bulgaria reported a long list of about 40 international and national projects in the field of climate change research, systematic observation and climate modelling addressing forestry, agriculture, climate change impact and vulnerability assessment, meteorological phenomena, the freshwater ecosystem, extreme weather events, air pollution and sustainable management of fisheries. The most important projects are Climate-Smart Forestry in Mountain Regions (2016–2020); the standardized automated large-scale monitoring of the atypical phenology of the European pine tree species as a result of climate change in two remote areas in France and Bulgaria (2017–2019); the assessment of heavy rainfall, strong winds, hailstorms and thunderstorms, and ice conditions for 28 administrative districts of Bulgaria (2016); and the mapping and assessment of freshwater ecosystem services in Bulgaria (2015–2017). Approximately two thirds of research funding in Bulgaria comes from the State budget and the rest is provided by the private sector. The two national funds, the Research and Development Fund and the National Innovation Fund, are considered the most important potential sources of financing for the measures proposed in Bulgaria's TNAPCC.

97. In terms of activities related to systematic observation, Bulgaria reported on national plans, programmes and support for ground- and space-based climate observing systems, including satellite and non-satellite climate observation. Activities related to systematic observation in Bulgaria are closely linked to its general commitments in the field of meteorology. There are no Global Surface Network or Global Upper Air Network stations located in Bulgaria. There is only one Global Atmosphere Watch station in the country, located in Rojen. NIMH has several weather stations included within the Regional Basic Synoptic Network and Regional Basic Climatological Network in Regional Association VI (Europe). NIMH also has about 40 synoptic and more than 90 climatic stations all over the country. These stations transmit data either daily in real time or at weekly intervals to the NIMH branches. The Acad. L. Krastanov agency, an important part of the Geophysical Institute, is involved in registration, processing, analysis and interpretation of the seismicity, geomagnetic field, ionosphere and ultraviolet radiation level above the country and region. The Institute of Oceanology carries out studies on the physical, chemical and biological parameters of seawater and the seabed in the western part of the Black Sea. The Institute attempts to improve oceanographic systems for observations to be included in international programmes. The Space Research and Technology Institute participates in national and international space-based observation programmes. Bulgaria uses satellite images for observations and as a main source of information.

98. In its NC7 Bulgaria did not provide information on actions taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring systems in developing countries (see issue 1 in table 20).

**2. Assessment of adherence to the reporting guidelines**

99. The ERT assessed the information reported in the NC7 of Bulgaria and identified issues relating to completeness and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 20.

Table 20  
**Findings on research and systematic observation from the review of the seventh national communication of Bulgaria**

<i>No.</i>	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 58  Issue type: completeness  Assessment: recommendation	In its NC7 Bulgaria did not report on actions taken to support capacity-building related to research and systematic observation in developing countries.  During the review, Bulgaria explained that it is a country with an economy in transition and therefore provides financial assistance on a voluntary basis. In addition, as Bulgaria is a non-Annex II Party, it may provide support for related capacity-building activities in developing countries if it is in a position to do so.  The ERT recommends that Bulgaria report on actions taken to support capacity-building related to research and systematic observation in developing countries or clarify in its next NC that such support was not provided.
2	Reporting requirement specified in paragraph 62  Issue type: completeness  Assessment: encouragement	In its NC7 Bulgaria did not provide information on the identification of opportunities for and barriers to free and open international exchange of data and information, or report on action taken to overcome such barriers.  During the review, Bulgaria explained that it contributes to free data exchange as NIMH is part of the World Meteorological Organization. Also through NIMH, Bulgaria cooperates with other international organizations and programmes that aim at free and open international exchange of data and information.  The ERT encourages Bulgaria to include in its next NC information on the identification of opportunities for and barriers to free and open international exchange of data and information and on action taken to overcome such barriers.
3	Reporting requirement specified in paragraph 63	In its NC7 Bulgaria did not provide information on highlights, innovations and significant efforts made with regard to socioeconomic analysis, including analysis

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
	Issue type: completeness	of the impacts of climate change and response options and the research and development of mitigation and adaptation technologies.
	Assessment: encouragement	<p>During the review, Bulgaria explained that the National Climate Change Adaptation Strategy was built on the National Climate Change Risk and Vulnerability Assessment of the Bulgarian Economic Sectors and draws extensively on the information, analyses and recommendations of the nine sector assessment reports, which evaluate the social and economic implications of climate change impacts and adaptation actions in Bulgaria and highlight the costs of inaction and the benefits of climate action within an economy-wide framework. Bulgaria also explained that it participates in the EU Framework Programme for Research and Innovation. The national coordinator of the programme is the Bulgarian Ministry of Education and Science. Funding opportunities under the Horizon 2020 programme are set out in multiannual work programmes, which cover the majority of the support available. The work programmes are prepared by the European Commission within the framework of the Horizon 2020 legislation and through a strategic programming process that integrates EU policy objectives into the priority-setting. One of the focus areas of Horizon 2020 is climate action, environment, resource efficiency and raw materials, in relation to which Bulgaria has participated in different projects, such as IMPRESSIONS (November 2013 to October 2018) and BACCHUS (December 2013 to May 2018).</p> <p>The ERT encourages Bulgaria to include in its next NC highlights, innovations and significant efforts made with regard to socioeconomic analysis and research and development of mitigation and adaptation technologies.</p>

*Note:* Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

## G. Education, training and public awareness

### 1. Technical assessment of the reported information

100. In its NC7 Bulgaria provided information on its actions relating to education, training and public awareness at the domestic and international level. The Party provided information on the general policy on education, training and public awareness; primary, secondary and higher education; public information campaigns; training programmes; education materials; and resource or information centres. However, the ERT noted that the NC7 presents the same information on education, training and public awareness as the NC6. During the review, Bulgaria presented new and updated information on measures for enhancing climate change education according to the third National Action Plan on Climate Change 2013–2020 based on the two main relevant State documents – the National Strategy of Scientific Research until 2020, adopted in 2010, and the Programme for Development of Education, Science and Youth Policies in the Republic of Bulgaria, adopted in 2009. Such measures aim to introduce the topics of climate change and emission reduction into the education process, including degree programmes on climate change and water management, ecology and environmental protection.

101. In its NC7 Bulgaria did not report information on participation in international activities related to education, training and public awareness. During the review, Bulgaria provided additional information on some international training courses and projects for education, training and awareness-raising in cooperation with countries such as Norway, Romania and Serbia. The international training courses were carried out in 2016 with the participation of lecturers from the University of Ruse, University of Chemical Technology and Metallurgy and St Ivan Rilski University. In addition, an international project was carried out by Trakia University in 2013–2016 with financial support from the Norwegian Government through the Norwegian Financial Mechanism within programme area BG10 on green industry innovation. The ERT encourages Bulgaria to include this information in its next NC.

102. Bulgaria reported that its Ministry of Education and Science is responsible for implementing the national education policy. The topics of environmental protection and climate change are included in school syllabuses in subjects such as natural science and environment, geography, environmental chemistry and biology. Familiarizing students with the topics of natural environment and climate change through training, trips and games is one of the main priorities of the education system in Bulgaria. Introducing compulsory environmental lessons in primary schools and outdoor activities is also being considered. There are university courses on climate change, ecology, environmental protection, biomanagement, sustainable development and eco-economy. Bulgaria reported that the third National Action Plan on Climate Change includes measures for incorporating climate change issues into research and development and educational activities in the field of education and science. The results are to be considered over the long term and in the context of the flagship initiatives under the Europe 2020 strategy for smart, sustainable and inclusive growth related to the promotion of innovation and the transition to a more efficient use of resources and a low-carbon economy. Bulgaria carried out a project for the self-assessment of its capacity in the field of sustainable development in 2004, aiming to improve its education system in the area of climate change and to achieve positive short- and long-term results. The results of the project assisted the Party in defining its priority topics related to environmental education and public awareness on climate change.

103. The Government, media and communication channels in Bulgaria have made concerted efforts to enhance public awareness on climate change in the country, including distributing brochures and materials on climate change, holding climate change days as part of national environmental campaigns, and sharing information about the current national climate change policy on the MoEW website.

**2. Assessment of adherence to the reporting guidelines**

104. The ERT assessed the information reported in the NC7 of Bulgaria and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 21.

Table 21  
**Findings on education, training and public awareness from the review of the seventh national communication of Bulgaria**

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
1	Reporting requirement specified in paragraph 65  Issue type: transparency  Assessment: recommendation	In its NC7 Bulgaria reported information on its actions relating to education, training and public awareness. However, the ERT noted that the NC7 presents the same information on education, training and public awareness as the NC6.  During the review, Bulgaria provided updated information on its actions relating to education, training and public awareness (see paras. 100 and 101 above). The ERT noted that the information provided by Bulgaria was available at the time of the publication of the NC7.  The ERT recommends that Bulgaria report in its next NC all available and up-to-date information on its actions relating to education, training and public awareness.
2	Reporting requirement specified in paragraph 65  Issue type: completeness  Assessment: encouragement	In its NC7 Bulgaria did not report information on the extent of public participation in the preparation or domestic review of its NC7.  During the review, Bulgaria reported that its NC7 was prepared by MoEW in cooperation with the Ministry of Agriculture, Food and Forestry, the Ministry of Energy, the Ministry of Transport, Information Technology and Communications, the National Institute of Meteorology and Hydrology and the Bulgarian Academy of Sciences and on the basis of current information, documents and legislation. All information presented is public and accessible on the websites of ministries, agencies and organizations and the public consultation portal. The portal, which has several sections (public consultation, strategic documents, publications and discussion forum), aims to promote cooperation between citizens, business and non-governmental organizations and experts in State institutions on policy formulation

No.	<i>Reporting requirement, issue type and assessment</i>	<i>Description of the finding with recommendation or encouragement</i>
3	Reporting requirement specified in paragraph 66  Issue type: completeness  Assessment: encouragement	<p data-bbox="544 220 1409 283">and law-making. The NC7 was published on the public consultation portal of the MoEW website.</p> <p data-bbox="544 294 1409 378">The ERT encourages Bulgaria to include in its next NC information on the extent of public participation in the preparation or domestic review of its NCs, to improve the completeness of its reporting.</p> <p data-bbox="544 399 1409 483">In its NC7 Bulgaria did not report information on the involvement of public organizations and non-governmental organizations in training and public awareness actions and plans.</p> <p data-bbox="544 493 1409 693">During the review, Bulgaria explained that MoEW is actively involved with non-governmental organizations in training and public awareness actions and plans. During the reporting period, the information on climate change policy on the MoEW website was periodically updated. Climate change policy is also presented at various forums, meetings with non-governmental organizations and businesses, conferences, seminars and training sessions to familiarize stakeholders with relevant and up-to-date aspects of the policy development.</p> <p data-bbox="544 703 1409 819">The ERT encourages Bulgaria to improve the completeness of its reporting by including information on the involvement of public organizations and non-governmental organizations in its training and public awareness actions and plans in its next NC.</p>

*Note:* Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs. The reporting on the requirements not included in this table is considered to be complete, transparent and adhering to the UNFCCC reporting guidelines on NCs.

### III. Conclusions and recommendations

105. The ERT conducted a technical review of the information reported in the NC7 of Bulgaria in accordance with the UNFCCC reporting guidelines on NCs. The ERT concludes that the reported information mostly adheres to the UNFCCC reporting guidelines on NCs and that the NC7 provides an overview of the national climate policy of Bulgaria.

106. The information provided in the NC7 includes most elements of the supplementary information under Article 7 of the Kyoto Protocol, with the exception of information on the national registry, and domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures. 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 was provided in Bulgaria's 2018 annual submission.

107. Bulgaria's total GHG emissions excluding LULUCF covered by its quantified economy-wide emission reduction target were estimated to be 43.2 per cent below its 1990 level, whereas total GHG emissions including LULUCF were 41.1 per cent below its 1990 level, in 2016. The decrease in total emissions was driven mainly by the deep economic recession due to the collapse of the centralized planning economy (in 1988–1991), economic crises (in 1998 and 2008) and the underlying continuous change in economic structure from heavy industry to service sectors.

108. Bulgaria's main policy framework relating to energy and climate change is the third National Action Plan on Climate Change for 2013–2020, which provides measures and targets for reducing GHG emissions and achieving energy efficiency across all sectors. Bulgaria's mitigation actions are consistent with its participation in the EU ETS and commitments under the EU climate and energy package as an EU member State. The mitigation actions are stated as being consistent with the potential of the national economy for reducing emissions. Among the mitigation actions that are critical for Bulgaria's contribution to attaining the EU-wide 2020 emission reduction target are those in the energy sector (e.g. improvement of energy production efficiency in existing coal-fired power plants) and the waste sector (e.g. capture and burning of biogas at all new and existing regional landfills).

109. Bulgaria's total GHG emissions excluding LULUCF in 2020 and 2030 are projected to be 59,068.83 and 55,492.74 kt CO<sub>2</sub> eq, respectively, under the WEM scenario, which represents a decrease of 43.0 and 46.5 per cent, respectively, below the 1990 level. Under the WAM scenario, emissions in 2020 and 2030 are projected to be lower than those in 1990 by 48.6 and 51.9 per cent and amount to around 53,325.50 and 49,826.80 kt CO<sub>2</sub> eq, respectively. The 2020 projections suggest that Bulgaria will continue contributing to the achievement of the EU target under the Convention.

110. Bulgaria's target for non-ETS sectors is to limit its emission growth to 20 per cent above the 2005 level by 2020. Bulgaria's AEAs, which correspond to its national emission target for non-ETS sectors, change linearly from 26,933.22 kt CO<sub>2</sub> eq in 2013 to 26,543.23 kt CO<sub>2</sub> eq for 2020. According to the projections under the WEM scenario, emissions from non-ETS sectors are estimated to reach 21,741.6 kt CO<sub>2</sub> eq by 2020. Under the WAM scenario, Bulgaria's emissions from non-ETS sectors in 2020 are projected to be 19,730.46 kt CO<sub>2</sub> eq. The projected levels of emissions under the WEM and WAM scenario are 18.1 and 25.7 per cent, respectively, below the AEA for 2020. The ERT noted that this suggests that Bulgaria expects to meet its ESD target under both the WEM and the WAM scenario.

111. According to the NC7, Bulgaria is not planning to make use of the Kyoto Protocol mechanisms to meet its Kyoto Protocol target.

112. Bulgaria is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraphs 3, 4 and 5, of the Convention. However, Bulgaria provided some information on its provision of support to developing country Parties. Bulgaria reported that in 2015 it announced its grant contribution of EUR 100,000 to the Green Climate Fund.

113. Bulgaria provided the required information on the expected impacts of climate change in the country; adaptation policies covering regional, sectoral and cross-sectoral vulnerabilities; and an outline of the actions taken to implement Article 4, paragraph 1(b) and (e), of the Convention regarding adaptation. The economic sectors vulnerable to climate change impacts in Bulgaria are agriculture, forestry, water resources, energy, transport, biodiversity and ecosystems, urban environment, human health and tourism. Key vulnerabilities include increasing drought severity and decreasing annual precipitation; soil moisture deficit, which affects the productivity and sustainability of the forest ecosystems; increased incidence of forest fires; temperature rise, which will increase water deficit in drought-prone soils; decreased annual river run-off; reduced efficiency of power generation; infrastructure damage resulting from extreme weather events; loss of biodiversity; increased incidence of vector-borne diseases; and degradation of tourism destinations. Bulgaria provided information on the adaptation measures planned for the vulnerable economic sectors.

114. Bulgaria provided information on its general policy and funding relating to research and systematic observation and addressed both domestic and international activities, including a summary of information on its Global Climate Observing System activities. Research-related activities in Bulgaria focus mainly on climate variability and change; vulnerability assessment and adaptation of individual sectors to climate change; solar-terrestrial influences; meteorology, climatology and hydrology; air pollution; climate-related technologies; territorial structure; and transport. The Bulgarian Academy of Sciences carries out climate change research activities, both nationally and in cooperation with research organizations from other countries. Activities related to systematic observation in Bulgaria are closely linked to its general commitments in the field of meteorology. There is only one Global Atmosphere Watch station in the country, located in Rojen. NIMH has about 40 synoptic and more than 90 climatic stations all over the country.

115. Bulgaria provided outdated information in its NC7 on its actions relating to education, training and public awareness at the domestic and international level, but presented new and updated information during the review. It reported that the Ministry of Education and Science is responsible for the implementation of the national policy in the field of education. The Party provided information on measures for enhancing climate change education according to the third National Action Plan on Climate Change (2013–2020) based on the two main relevant State documents – the National Strategy of Scientific Research until 2020, adopted



in 2010, and the Programme for Development of Education, Science and Youth Policies in the Republic of Bulgaria, adopted in 2009. Bulgaria also provided additional information on its involvement in international training courses and projects on education, training and awareness-raising in cooperation with countries such as Norway, Romania and Serbia.

116. In the course of the review, the ERT formulated the following recommendations for Bulgaria to improve its adherence to the UNFCCC reporting guidelines on NCs and its reporting of supplementary information under the Kyoto Protocol:<sup>5</sup>

- (a) To improve the completeness of its reporting by:
  - (i) Describing the process for recalculating previously submitted inventory data (see issue 1 in table 7);
  - (ii) Providing information on the national registry, in particular on the items described in paragraphs 32(c)–(f), (i) and (j) of the reporting guidelines for supplementary information (see issue 1 in table 8);
  - (iii) Providing information on the enforcement and administrative procedures that it has in place to meet its commitments under the Kyoto Protocol, including the procedures for addressing cases of non-compliance (see issue 1 in table 9);
  - (iv) Providing information on national legislative arrangements and administrative procedures that ensure sustainable use of natural resources and the conservation of biodiversity when implementing activities under Article 3, paragraph 3, and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol (see issue 2 in table 9);
  - (v) Providing information about how it believes its PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals consistent with the objective of the Convention (see issue 10 in table 11);
  - (vi) Providing information on how it is striving, under Article 3, paragraph 14, of the Kyoto Protocol to implement its commitments under Article 3, paragraph 1, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties (see issue 11 in table 11);
  - (vii) Providing WAM projections on a gas-by-gas basis (see issue 2 in table 15);
  - (viii) Providing information relating to fuel sold to ships and aircraft engaged in international transport, to the extent possible, separately and included in the totals (see issue 4 in table 15);
  - (ix) Providing the estimated and expected total effect of implemented and adopted policies and measures (see issue 1 in table 17);
  - (x) Providing an estimate of the total effect of its PaMs in accordance with the WEM scenario, compared with a situation without such PaMs (see issue 2 in table 17);
  - (xi) Providing information on actions taken to support capacity-building related to research and systematic observation in developing countries, or clarifying in its next NC that such support was not provided (see issue 1 in table 20);
- (b) To improve the transparency of its reporting by:
  - (i) Providing a more elaborated description of the PaMs adopted in the energy, transport and industry sectors to implement its commitments under Article 4, paragraph 2(a) and (b), of the Convention (see issue 1 in table 11);
  - (ii) Providing updated information on its actions relating to education, training and public awareness available at the time of the submission or explaining if no changes or updates have occurred since its previous submission (see issue 1 in table 21).

<sup>5</sup> The recommendations are given in full in the relevant sections of this report.

#### **IV. Questions of implementation**

117. During the review the ERT assessed the NC7, including the supplementary information provided under Article 7, paragraph 2, of the Kyoto Protocol, and the information on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol, with regard to timeliness, completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. No questions of implementation were raised by the ERT during the review.

## Annex

### Documents and information used during the review

#### A. Reference documents

Compilation of economy-wide emission reduction targets to be implemented by Parties included in Annex I to the Convention. Available at <https://unfccc.int/topics/mitigation/workstreams/pre-2020-ambition/compilation-of-economy-wide-emission-reduction-targets-to-be-implemented-by-parties-included-in-annex-i-to-the-convention>.

2017 GHG inventory submission of Bulgaria. Available at <https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/submissions/national-inventory-submissions-2017>.

2018 GHG inventory submission of Bulgaria. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories-annex-i-parties/national-inventory-submissions-2018>.

BR3 of Bulgaria. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/third-biennial-reports-annex-i>.

BR3 CTF tables of Bulgaria. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/third-biennial-reports-annex-i>.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories”. Annex to decision 24/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf>.

“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 the information required under Article 7 of the Kyoto Protocol”. Annex to decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Annex III to decision 3/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf>.

“Guidelines for review under Article 8 of the Kyoto Protocol”. Annex to decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf>.

“Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”. Annex to decision 13/CP.20. Available at <http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf>.

NC7 of Bulgaria. Available at <https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-reports-annex-i-parties/seventh-national-communications-annex-i>.

Report on the individual review of the annual submission of Bulgaria submitted in 2016. FCCC/ARR/2016/BGR. Available at <https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories/greenhouse-gas-inventory-review-reports-2016>.

Report of the technical review of the second biennial report of Bulgaria. FCCC/TRR.2/BGR. Available at <https://unfccc.int/node/66151>.

Report on the technical review of the sixth national communication of Bulgaria. FCCC/IDR.6/BGR. Available at <https://unfccc.int/node/66151>.

Revisions to the guidelines for review under Article 8 of the Kyoto Protocol. Annex I to decision 4/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf>.

“Trends and Projections Europe 2018: Tracking Progress Towards Europe's Climate and Energy Targets”. Available at <https://www.eea.europa.eu/publications/trends-and-projections-in-europe-2018-climate-and-energy>.

“UNFCCC biennial reporting guidelines for developed country Parties”. FCCC/SBSTA/2014/INF.6. Annex I to decision 2/CP.17. Available at <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf>.

## **B. Additional information provided by the Party**

Responses to questions during the review were received from Ms. Detelina Petrova (MoEW), including additional material. The following documents<sup>1</sup> were provided by Bulgaria:

Ministry of Environment and Water. Republic of Bulgaria. First official report on the implementation of the third national action plan on climate change 2013-2020. June 2017. Available at web address:

[https://www.moew.government.bg/static/media/ups/articles/attachments/Otchet\\_3NAPCC\\_final\\_ENdc802c307573136d4da0575563ea83a3.doc](https://www.moew.government.bg/static/media/ups/articles/attachments/Otchet_3NAPCC_final_ENdc802c307573136d4da0575563ea83a3.doc)

“Energy Efficiency Trends and Policies in Bulgaria” Available at <http://www.odyssee-mure.eu/publications/national-reports/energy-efficiency-bulgaria.pdf>.

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<sup>1</sup> Reproduced as received from the Party.