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Report on the technical review of the seventh national communication of Turkey

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 Turkey, 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".

Contents

Abbreviations and acronyms

Annex II Party	Party included in Annex II to the Convention
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BR	biennial report
CCAMCB	Climate Change and Air Management Coordination Board
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CTF	common tabular format
ERT	expert review team
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
HFC	hydrofluorocarbon
INDC	intended nationally determined contribution
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
NA	not applicable
NC	national communication
NE	not estimated
NF_3	nitrogen trifluoride
NIR	national inventory report
NO	not occurring
N_2O	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_6	sulfur hexafluoride
TSMS	Turkish State Meteorological Service
UNFCCC reporting guidelines on BRs	"UNFCCC biennial reporting guidelines for developed country Parties"
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 existing measures'
WOM	'without measures'

I. Introduction and summary

A. Introduction

1. This is a report on the in-country technical review of the NC7 of Turkey. 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).[1]

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

3. The review was conducted from 18 to 23 February 2019 in Ankara by the following team of nominated experts from the UNFCCC roster of experts: Mr. Federico Brocchieri (Italy), Ms. Ngozi Eze (Nigeria), Ms. Pia Paola Huber (Austria) and Mr. Samir Tantawi (Egypt). Ms. Huber and Mr. Tantawi were the lead reviewers. The review was coordinated by Mr. Pedro Torres (UNFCCC secretariat).

B. Summary

4. The ERT conducted a technical review of the information reported in the NC7 of Turkey 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 26 December 2018, after the deadline of 1 January 2018 mandated by decision 9/CP.16.

6. During the review, Turkey explained that the NC7 had been prepared within the framework of the Support for the Preparation of Turkey's Seventh National Communication and Third Biennial Report to UNFCCC project, which was co-financed by the GEF and Turkey and began in September 2017. Therefore, the submission of the NC7 was delayed. Turkey stated that it has already begun the arrangements for its application for GEF financing for the preparation and submission of its NC8, which is therefore expected to be submitted on time.

7. Turkey informed the secretariat on 20 December 2017 about its difficulties with making a timely submission. In accordance with decisions 13/CP.20 and 22/CMP.1, a Party should inform the secretariat thereof by the due date of the submission in order to facilitate the arrangement of the review process. The ERT noted with great concern the delay in the submission and recommended that Turkey make its next submission on time. As the submission was not made within six weeks after the due date (by 15 February 2018), the delay was brought to the attention of the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol and the Compliance Committee and made public.

[1] At the time of the publication of this report, Turkey had not yet submitted its instrument of acceptance of the Doha Amendment, and 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.

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

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

Table 1
Assessment of completeness and transparency of mandatory information reported by Turkey in its seventh national communication, including supplementary information under the Kyoto Protocol

Section of NC	*Completeness*	*Transparency*	*Reference to description of recommendations*	*Supplementary information under the Kyoto Protocol*	*Completeness*	*Transparency*	*Reference to description of recommendations*
Executive summary	Complete	Transparent		National system[a]	NA	NA	
National circumstances	Complete	Mostly transparent	Issue 1 in table 4	National registry[a]	NA	NA	
GHG inventory	Complete	Transparent		Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17[a]	NA	NA	
PaMs	Mostly complete	Mostly transparent	Issues 4 and 7 in table 7	PaMs in accordance with Article 2	Mostly complete	Transparent	Issue 9 in table 7
Projections and the total effect of PaMs	Partially complete	Mostly transparent	Issues 2, 5 and 13 in table 11 and issues 1 and 3 in table 13	Domestic and regional programmes and/or arrangements and procedures	Complete	Transparent	
Vulnerability assessment, climate change impacts and adaptation measures	Complete	Mostly transparent	Issue 1 in table 15	Information under Article 10[b]	Complete	Transparent	
Financial resources and transfer of technology[c]	NA	NA		Financial resources[d]	NA	NA	
Research and systematic observation	Complete	Transparent		Minimization of adverse impacts in accordance with Article 3, paragraph 14	NA	NA	
Education, training and public awareness	Complete	Transparent					

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.

[a] As a Party included in Annex I to the Convention with no commitments inscribed in Annex B to the Kyoto Protocol, Turkey has no obligation to report on its national system in accordance with Article 5, paragraph 1, of the Kyoto Protocol; its national registry; supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol; or the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

[b] 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. An 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.

[c] Turkey 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.

[d] Turkey is not an Annex II Party to the Convention 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

9. 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 Turkey

Supplementary information	*Reference to section of NC7*
National registry[a]	NA
National system[a]	NA, but elements reported in section 3.3
Supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17[a]	NA
PaMs in accordance with Article 2	4.3.3 and 4.3.4
Domestic and regional programmes and/or legislative arrangements and enforcement and administrative procedures	3.3, 4.1 and 4.2
Information under Article 10	3.3, 4.3, 6.4, 7, 8.5, 8.2 and 9
Financial resources[b]	NA
Minimization of adverse impacts in accordance with Article 3, paragraph 14[a]	NA

[a] As a Party included in Annex I to the Convention with no commitments inscribed in Annex B to the Kyoto Protocol, Turkey has no obligation to report on its national system in accordance with Article 5, paragraph 1, of the Kyoto Protocol; its national registry; supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol; or the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

[b] Reporting on financial resources under the Kyoto Protocol is relevant to Annex II Parties. As Turkey 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

10. The national circumstances of Turkey explain the relationship between its historical and future emission trends and the climate change policy agenda. The changing nature of those circumstances defines the factors that affect the climate policy development and implementation of the Convention. The NC7 contains key data on legislation, population trends, geography and land use, climate and climate change, economic developments, energy, transport, the buildings sector, industry, trade, the services sector, agriculture, forestry, resource efficiency and wastewater.

11. Turkey provided information on how its national circumstances and changes therein affect GHG emissions and removals over time. Population and economic growth were cited as the main drivers for the increase in GHG emissions. Turkey's population is expected to increase by about 1 per cent per year between 2018 and 2025, reaching 88.8 million inhabitants in 2025. The Party stated in its NC7 that the Organisation for Economic Co-operation and Development estimates that Turkey will have an average annual growth rate of 4.9 per cent in the period 2015–2025. Turkey also stated that GHG emissions are expected to increase in parallel with GDP growth over the next decade.

12. The ERT noted that during the period 1990–2016 Turkey's GDP per capita increased by 108.4 per cent, while GHG emissions per GDP unit decreased by 23.4 per cent. The ERT further noted that GHG emissions per capita increased by 59.7 per cent during the same period. Although GHG emissions per GDP unit decreased, notably from 0.33 kg CO_2 eq/United States dollar in 2009 to 0.26 kg CO_2 eq/United States dollar in 2015, the ERT noted a slight increase of 2.3 per cent from 2015 to 2016. The sector with the highest increase in emissions between 1990 and 2016 was the energy sector, in particular energy industries (increase of 290.8 per cent) and transportation (increase of 203.5 per cent), followed by the IPPU sector with an increase of 172.7 per cent. In Turkey there is still a strong link between economic growth and increases in GHG emissions, particularly those from the energy and IPPU sectors. Table 3 illustrates the national circumstances of Turkey by providing some indicators relevant to emissions and removals.

Table 3
Indicators relevant to greenhouse gas emissions and removals for Turkey for the period 1990–2016

						Change (%)	
Indicator	*1990*	*2000*	*2010*	*2015*	*2016*	*1990–2016*	*2015–2016*
GDP per capita (thousands 2011 USD using purchasing power parity)	11.40	13.86	17.96	23.39	23.76	108.4	1.6
GHG emissions without LULUCF per capita (t CO_2 eq)	3.91	4.64	5.57	6.00	6.24	59.7	3.9
GHG emissions without LULUCF per GDP unit (kg CO_2 eq per 2011 USD using purchasing power parity)	0.34	0.33	0.31	0.26	0.26	–23.4	2.3

Sources: (1) GHG emission data: Turkey's 2018 GHG inventory submission, version 1.0; (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.

(b) Assessment of adherence to the reporting guidelines

13. The ERT assessed the information reported in the NC7 of Turkey and identified issues relating to transparency. The findings are 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 Turkey

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 8 Issue type: transparency	The Party provided a description of how its national circumstances and changes therein affect GHG emissions and removals over time. However, this information is not transparent as the Party did not address the effects on GHG emissions from the agriculture, forestry and tourism sectors.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Assessment: recommendation	During the review, Turkey explained that GHG emissions from agricultural soils have been increasing owing to an increase in nitrogen fertilizer consumption and that the Ministry of Agriculture and Forestry has a programme to promote nitrogen-fixing crops and hence reduce nitrogen fertilizer consumption. With regard to forestry, the removal of CO_2 is expected to increase as a result of forest rehabilitation and afforestation activities. Lastly, for tourism, Turkey explained that the number of foreign tourists is expected to increase from more than 30 million in 2012 to about 50 million per year by 2023, which will mean an increase in GHG emissions from international aviation. The ERT recommends that Turkey provide transparent information on how its national circumstances and changes therein affect GHG emissions and removals. Specifically, the ERT notes the importance of providing information on the effects of national circumstances on emissions from the agriculture, forestry and tourism sectors in its next NC.
2	Reporting requirement specified in paragraph 8 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not report in its NC7 detailed information on how its national circumstances are relevant to factors affecting GHG emissions, including disaggregated indicators. During the review, Turkey provided information on the tools and methods used to assess how its national circumstances affect its GHG emissions and removals. Turkey mentioned that it uses TIMES, an integrated supply/demand software developed and supported by the International Energy Agency, as a modelling framework for such assessments, and that the results from the current modelling project will be available by May 2019. The ERT encourages Turkey to report information on how its national circumstances are relevant to factors affecting GHG emissions and removals, including disaggregated indicators. The ERT notes that Turkey could include, for example, information on the results of the TIMES modelling framework project in its next NC.
3	Reporting requirement specified in paragraph 8 Issue type: transparency Assessment: encouragement	The ERT noted that the information provided by Turkey to describe its national circumstances was not always transparent. For example, it noted that Turkey reported on an increase in the use of coal for electricity production since 2002 (figure 2.15 of the NC7), which does not seem to be in line with the information provided in the NC7 on Turkey's National Climate Change Strategy (2010–2023). The ERT also noted that the Party reported in the NC7 (p.41) that there had been a significant decline in agricultural land in Turkey since 1990, from 27.9 million ha in 1990 to 23.7 million ha in 2016; however, GHG emissions from agricultural soils increased by 42.9 per cent in the same period (common reporting format table 10). During the review, Turkey explained that, although the use of coal for electricity production had increased since 2002, the installed capacity for electricity production from coal decreased from 25 to 22 per cent between 2006 and 2017 and the installed capacity for electricity production from natural gas from 28 to 26 per cent, which is in accordance with the National Climate Change Strategy (2010–2023). With regard to agricultural land Turkey clarified that the decrease was mainly due to the selling of unprofitable abandoned fields. Turkey further clarified that it has plans to increase livestock numbers to produce sustainable food from local sources, which will lead to an increase in emissions from agriculture. The ERT encourages Turkey to provide transparent information on its national circumstances and historical trends. The ERT noted that Turkey could explain, for example, how the increase in the use of coal for electricity production is in line with the National Climate Change Strategy (2010–2023) and include information on the installed capacity for electricity production by primary energy sources in its next NC. Turkey could also explain the reasons for the decrease in agricultural lands and the increase in GHG emissions from agricultural soils.

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

14. Total GHG emissions[2] excluding emissions and removals from LULUCF increased by 135.4 per cent between 1990 and 2016, and total GHG emissions including net emissions or removals from LULUCF also increased by 135.4 per cent over the same period. Table 5 illustrates the emission trends by sector and by gas for Turkey.

Table 5
Greenhouse gas emissions by sector and by gas for Turkey for the period 1990–2016

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2015*	*2016*	*1990–2016*	*2015–2016*	*1990*	*2016*
Sector									
1. Energy	134 327.90	212 330.42	292 323.66	339 721.86	360 978.43	168.7	6.3	63.7	72.8
A1. Energy industries	37 004.37	78 014.18	114 022.78	136 335.11	144 609.80	290.8	6.1	17.6	29.2
A2. Manufacturing industries and construction	32 381.05	53 668.89	54 434.98	57 308.53	59 691.13	84.3	4.2	15.4	12.0
A3. Transport	26 968.90	36 464.87	45 391.99	75 797.65	81 841.20	203.5	8.0	12.8	16.5
A4. and A5. Other	33 673.33	38 233.10	70 355.00	65 033.36	66 540.39	97.6	2.3	16.0	13.4
B. Fugitive emissions from fuels	4 300.11	5 949.26	8 118.78	5 247.08	8 295.78	92.9	58.1	2.0	1.7
C. CO_2 transport and storage	0.13	0.13	0.13	0.13	0.13	0.0	0.0	0.0	0.0
2. IPPU	22 893.94	26 643.60	49 215.31	59 574.33	62 422.04	172.7	4.8	10.9	12.6
3. Agriculture	42 402.30	40 032.91	42 826.37	53 650.01	56 485.70	33.2	5.3	20.1	11.4
4. LULUCF	–28 922.68	–34 739.75	–45 956.63	–63 668.94	–68 078.21	135.4	6.9	NA	NA
5. Waste	11 090.59	14 487.23	18 198.35	16 984.25	16 181.19	45.9	–4.7	5.3	3.3
6. Other	NO	NO	NO	NO	NO	NA	NA	NA	NA
Gas[a]									
CO_2	146 507.20	226 029.84	319 528.40	380 858.10	402 820.78	174.9	5.8	69.5	81.2
CH_4	42 183.50	43 484.24	52 461.56	52 392.72	54 717.60	29.7	4.4	20.0	11.0
N_2O	21 398.73	22 596.29	25 889.96	29 769.97	31 960.68	49.4	7.4	10.2	6.4
HFCs	NO	115.66	3 054.28	4 805.04	4 719.62	NA	–1.8	NA	1.0
PFCs	625.30	601.00	461.74	119.72	24.58	–96.1	–79.5	0.3	0.0
SF_6	NO	667.13	1 167.75	1 984.90	1 824.09	NA	–8.1	NA	0.4
NF_3	NO	NO	NO	NO	NO	NA	NA	NA	NA
Total GHG emissions without LULUCF	**210 714.73**	**293 494.15**	**402 563.69**	**469 930.44**	**496 067.36**	**135.4**	**5.6**	**100.0**	**100.0**
Total GHG emissions with LULUCF	**181 792.04**	**258 754.41**	**356 607.05**	**406 261.50**	**427 989.15**	**135.4**	**5.3**	**NA**	**NA**

Source: GHG emission data: Turkey's 2018 annual submission, version 1.0.
[a] Emissions by gas without LULUCF and without indirect CO_2.

[2] In this report, the term "total GHG emissions" refers to the aggregated national GHG emissions expressed in terms of CO_2 eq excluding LULUCF, unless otherwise specified. Values in this paragraph are calculated on the basis of the Party's 2018 annual submission, version 1.0.

15. The increase in total emissions was driven mainly by factors such as a growing economy, population growth and rapid urbanization, which led to increased demand for housing, energy and transportation.

16. The energy sector is a major source of anthropogenic GHG emissions in Turkey. Between 1990 and 2016, GHG emissions from the energy sector increased by 168.7 per cent (226,650.53 kt CO_2 eq), owing mainly to an increase in emissions from energy industries (290.8 per cent or 107,605.43 kt CO_2 eq) due to rising public electricity use and heat production, and in emissions from transport (203.5 per cent or 54,872.30 kt CO_2 eq).

17. Between 1990 and 2016, GHG emissions from IPPU increased by 172.7 per cent (39,528.10 kt CO_2 eq), owing mainly to industrial growth and an increase in demand for construction materials. The increase in emissions from the IPPU sector is mainly associated with mineral industry, predominantly cement production, and metal industry, primarily iron and steel production. Between 1990 and 2016, GHG emissions from the agriculture sector increased by 33.2 per cent (14,083.41 kt CO_2 eq), owing mainly to rising emissions from enteric fermentation, agricultural soils and manure management. The LULUCF sector was a net sink of 68,078.21 kt CO_2 eq in 2016; net GHG removals have increased by 39,155.53 kt CO_2 eq since 1990, driven mainly by improvements in sustainable forest management, afforestation, rehabilitation of degraded forests and reforestation on forest land. Between 1990 and 2016, GHG emissions from the waste sector increased by 45.9 per cent (5,090.60 kt CO_2 eq), owing mainly to increased waste disposal due to population growth.

18. The summary information provided on GHG emissions was consistent with the information reported in the Party's 2016 annual submission.

(b) Assessment of adherence to the reporting guidelines

19. The ERT assessed the information reported in the NC7 of Turkey 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.

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

20. As a Party included in Annex I to the Convention with no commitments inscribed in Annex B to the Kyoto Protocol, Turkey has no obligation to report supplementary information on its national system under Article 5, paragraph 1, of the Kyoto Protocol. However, Turkey 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 most of the elements mandated by paragraph 30 of the annex to decision 15/CMP.1. The ERT commends Turkey for its efforts to include information on the national system in its NC7.

21. The ERT took note of the review of the changes to the national system reflected in the report on the individual review of the 2016 annual submission of Turkey.

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

22. Turkey does not have a binding target for reducing its GHG emissions under the Kyoto Protocol, and consequently has no obligation to report on institutional arrangements and decision-making procedures relating to commitments, including those relating to participation in the Kyoto Protocol mechanisms. However, Turkey reported in its NC7 some information on legislative arrangements and procedures related to the Kyoto Protocol.

23. The overall responsibility for implementing the Kyoto Protocol lies with the Ministry of Environment and Urbanization. For reporting under the Kyoto Protocol, the Ministry of Environment and Urbanization coordinates the national institutions through CCAMCB with the participation of senior representatives of relevant ministries and institutions. CCAMCB relies on seven technical working groups with management support from a group of consultants and a secretariat.

24. The Ministry of Environment and Urbanization is the national focal point to the UNFCCC and coordinates the activities of CCAMCB, including those under the Convention and the United Nations Economic Commission for Europe. The role of CCAMCB includes taking decisions and measures to tackle climate change and prevent air pollution. Turkey's Statistical Institute is responsible for preparing and submitting the national GHG inventory and collecting data from relevant ministries.

25. Turkey has legislative arrangements and administrative procedures in place to make information publicly accessible, such as the e-Government portal,[3] which provides access to public services and promotes transparency. The ERT provided in the NC7 (p.232) a list of entities and their websites, including official government institutions, which provide information on climate change.

(b) Assessment of adherence to the reporting guidelines

26. The ERT assessed the information reported in the NC7 of Turkey 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.

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

(a) Technical assessment of the reported information

27. Turkey provided in its NC7 information on its package of PaMs implemented, adopted and planned in order to fulfil its commitments under the Convention and its Kyoto Protocol. Compared with the NC6, the NC7 presented a more coherent and systematic set of PaMs, as well as the latest information on Turkey's institutional, legal, administrative and procedural arrangements used for domestic compliance, monitoring, reporting, archiving of information and evaluation of the progress made towards its domestic targets. However, the lack of quantitative estimates of the impact of individual PaMs made it difficult for the ERT to assess whether the content of such PaMs was coherent with their respective goals.

28. Although Turkey is a Party included in Annex 1 to the Convention, it was officially recognized in decision 1/CP.16 that Turkey is in a situation different from that of other Parties included in Annex 1 to the Convention. Given its fast-growing population, energy demand and GDP over the last decade, Turkey aims to take actions to combat climate change that are in line with its national circumstances and capabilities.

29. With a view to aligning its domestic legislation with the EU acquis[4] as a candidate country for EU membership, Turkey has put in place a number of legislative acts, some of which directly and/or indirectly cover sectors that relate to climate change (energy, buildings, industry, transport, agriculture, forestry and waste), as outlined in the legislative framework reported in its NC7 (section 4.2).

30. On 30 September 2015, Turkey submitted an INDC to the secretariat for the period 2021–2030 in accordance with decisions 1/CP.19 and 1/CP.20. As stated in its INDC, Turkey intends to reduce its GHG emissions by up to 21 per cent below the WOM scenario by 2030, which corresponds to a reduction of 246.70 Mt CO_2 eq. Turkey outlined a large number of sectoral and cross-sectoral PaMs in its NC7 for meeting this objective.

[3] https://www.turkiye.gov.tr/.

[4] See https://ec.europa.eu/neighbourhood-enlargement/policy/glossary/terms/acquis_en.

31. In its NC7, Turkey provided information on its PaMs organized by sector (energy, buildings, industry, transport, agriculture, forestry and waste). Separate sections on cross-cutting PaMs and voluntary carbon markets were also included. During the review, Turkey explained that it considers buildings to be a subsector of the energy sector. Turkey also reported on its policy context and the legal and institutional arrangements put in place to implement its commitments and monitor and evaluate the effectiveness of its PaMs.

32. Turkey's key policy instrument for development is its development plans. The development plans have each covered a five-year period and are coordinated by the Strategy and Budget Directorate of the Presidency[5] and endorsed by the General Assembly. The latest five-year plan is the Tenth Development Plan, covering the period 2014–2018, and the new five-year plan covering the period 2019–2023 is currently being prepared.

33. Turkey's climate change policy is defined by two main cross-cutting documents: the National Climate Change Strategy (2010–2023), adopted in 2010 under the Ninth Development Plan and covering the period 2010–2023, and the National Climate Change Action Plan (2011–2023), which was prepared within the framework of the National Climate Change Strategy (2010–2023), covering the period 2011–2023. The National Climate Change Action Plan (2011–2023) established arrangements related to, inter alia, an emissions trading system and carbon market projects. Moreover, the Ministry of Environment and Urbanization developed and adopted its Strategic Plan in 2018 with the aim of integrating climate change action into urbanization strategies and policies.

34. Furthermore, despite not using the flexibility mechanisms of the Kyoto Protocol, Turkey is hosting a large number of projects related to hydropower, wind power, biogas, geothermal, energy efficiency and the development of carbon assets in the voluntary carbon market (the 348 projects hosted so far are expected to generate an annual GHG emission reduction of over 26 Mt CO_2 eq).

35. Turkey reported that there are no local strategy or action plans for metropolitan cities and that the enforcement of climate change action is problematic at the local level. Nevertheless, in its NC7 (annex III) Turkey described some of the projects implemented by local authorities in the areas of energy efficiency, renewable energy, sustainable means of transportation and the drafting of climate change mitigation and adaptation action plans.

36. Table 6 provides a summary of the reported information on the PaMs of Turkey.

Table 6
Summary of information on policies and measures reported by Turkey

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
Policy framework and cross-sectoral measures	Tenth Development Plan	NE	NE
	National Climate Change Strategy (2010–2023)	NE	NE
	National Climate Change Action Plan (2011–2023)	NE	NE
	Strategic Plan of the Ministry of Environment and Urbanization	NE	NE
Energy	Strategic Plan of the Ministry of Energy and Natural Resources	NE	NE
	National Energy and Mining Policy	NE	NE

[5] Following the transition to the presidential system in 2018 in Turkey, the Ministry of Development was replaced by the Strategy and Budget Directorate of the Presidency.

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
	Support to small and medium-sized enterprises for implementation of sustainable energy projects (in the industrial sector)	NE	NE
	Energy Sector Research and Development Projects Support Program (in the industrial sector)	NE	NE
Transport	Blending ethanol with gasoline	NE	NE
	Blending biodiesel with diesel	NE	NE
	Taxation based on GHG emissions	NE	NE
	Promotion of environmentally friendly vehicles	NE	NE
	Phasing out of old vehicles	NE	NE
	Promotion of electric and hybrid vehicles	NE	NE
	National Smart Transportation Systems Strategy	NE	NE
	Green Port Project	NE	NE
	Renewal of marine ships for transportation of goods	NE	NE
Renewable energy	Renewable Energy Sources Support Mechanism	NE	NE
	By-Law on Renewable Energy Resource Areas	NE	NE
	Promotion of power generation from renewable resources	NE	NE
	Promotion of renewable electricity use in industry	NE	NE
Energy efficiency	Energy Efficiency Strategy Paper	NE	NE
	Energy Efficiency Improvement Program	NE	NE
	National Energy Efficiency Action Plan	NE	NE
	Energy performance in buildings	NE	NE
	Green Airport Project	NE	NE
	National Eco-Efficiency Programme (in the industrial sector)	NE	NE
	Financial Support Scheme for Energy Efficiency Projects in Manufacturing Industry	NE	NE
Agriculture	Environmentally Based Agricultural Land Protection Programme	NE	NE
	Extending analysis-based fertilizer use	NE	NE
	Farmer registry system	NE	NE
	Organic farming registry system	NE	NE
	Good agricultural practices	NE	NE

Sector	*Key PaMs*	*Estimate of mitigation impact by 2020 (kt CO_2 eq)*	*Estimate of mitigation impact by 2030 (kt CO_2 eq)*
	Programme for Supporting Rural Development Investments	NE	NE
	Modern irrigation systems incentive	NE	NE
LULUCF	Actions under the National Forestry Programme	NE	NE
	Strategic Plan of the General Directorate of Forestry	NE	NE
Waste	National Waste Management and Action Plan	NE	NE
	Wastewater Treatment Action Plan	NE	NE
	Power generation from sanitary landfills	NE	NE
	Rehabilitation of landfills	NE	NE
	Zero waste	NE	NE

(b) Policies and measures in the energy sector

37. The energy sector (including energy industries, manufacturing industries and construction, transport and others) accounted for 72.8 per cent of Turkey's overall GHG emissions in 2016, which represents an increase of over 168 per cent compared with the 1990 level (see para. 16 above).

38. **Energy supply**. In its NC7, Turkey reported that it will prioritize ensuring a secure energy supply by reducing dependence on imports and increasing domestic supply. This would be achieved through a number of actions, including prioritizing local resources; increasing the share of renewable energy in the total energy supply; increasing energy efficiency; promoting market conditions; ensuring a diversity of resources in the petroleum and natural gas fields; and becoming an energy corridor and terminal in the context of regional collaboration. Furthermore, Turkey reported its plans to develop three nuclear power plants with a view to ensuring a secure energy supply and reducing GHG emissions. Turkey reported that when the first two plants (Akkuyu and Sinop) are fully operational, about 10 per cent of the country's total power generation will be supplied by nuclear energy. During the review, however, Turkey explained that the expected total power generation supplied by nuclear energy reported in the NC7 was not correct. It explained that its target for nuclear power is to use the first unit (1,200 MW) of the Akkuyu nuclear power plant by 2023. Although Turkey provided information on its plans to increase the use of local resources to reduce dependence on imports, more detailed and quantitative information is needed for the ERT to assess the extent to which domestic GHG emissions would be affected by these changes.

39. **Renewable energy sources**. In its NC7, Turkey reported that it aims to make extensive use of renewable energy. Renewable energy sources covered 53 per cent of the additional 8,500 MW capacity installed in Turkey in 2017. According to its National Energy and Mining Policy (2017), Turkey aims to increase the share of renewable energy in total energy production by at least 30 per cent, although no information was provided on when this would be implemented. During the review, Turkey clarified that the renewable energy target actually refers to increasing to 30.0 per cent the share of renewable energy in total electricity production, and not in total energy production, by 2023. PaMs that are particularly relevant to the renewable energy sector are the Renewable Energy Sources Support Mechanism, which has significantly accelerated renewable energy investments in wind and solar power, and the By-Law on Renewable Energy Resource Areas, which laid the groundwork for an effective and efficient use of Turkey's renewable energy sources by forming large-scale renewable energy resource areas. Turkey also reported other measures

that it has taken in pursuit of its goals, including several communiqués on blending practices for biofuels.

40. **Energy efficiency**. In its Energy Efficiency Strategy Paper (2012–2023), Turkey set a long-term target to reduce energy intensity by 20 per cent by 2023 compared with the 2011 level. This would be achieved by decreasing energy losses in the industrial and services sectors, decreasing the energy demand and carbon emissions of buildings, promoting sustainable and environmentally friendly buildings using renewable energy sources and decreasing the use of fossil fuels in various means of transportation at the national level. According to its National Energy and Mining Policy, Turkey aims to ensure a secure energy supply and predictable market conditions by reducing energy intensity by 20 per cent by 2023 compared with the 2008 level. During the review, however, Turkey clarified that the target actually refers to 2011 as the base year. Furthermore, Turkey adopted in 2018 a National Energy Efficiency Action Plan (2017–2023), which consists of 55 actions expected to require an investment of USD 10.9 billion by 2023. These actions are expected to bring about a cumulative 14 per cent reduction in primary energy consumption and a cumulative saving of 66.6 million t CO_2 by 2023.

41. **Residential and commercial sectors**. In its NC7, Turkey reported that energy efficiency in the buildings sector improved by 16.8 per cent from 2000 to 2016, and that it is aiming to pursue further improvements through a set of domestic policies and actions within the framework of the National Energy Efficiency Action Plan, with the goal of reducing energy consumption in the sector by 20 per cent by 2023. To support this goal, the project Energy Efficiency in Public Buildings was developed in cooperation with the German Climate Technology Initiative to provide consultancy services that will improve the legal framework conditions, thus increasing the demand for products and services that have the potential to increase energy efficiency, especially in public buildings.

42. **Transport sector**. Turkey reported that energy efficiency in the transport sector improved by 32.3 per cent from 2000 to 2016, according to data from the Ministry of Energy and Natural Resources. As the transport sector accounted for 22.7 per cent of Turkey's GHG emissions in 2016, the Party reported that it had identified several qualitative PaMs to reduce GHG emissions as part of its cross-cutting policies and its INDC, such as implementing sustainable transport approaches in urban areas, reducing fuel consumption and road transport emissions, increasing urban and high-speed railway projects and systems, and improving energy efficiency in airports. Moreover, the Transport and Communication Strategy, adopted in 2011, set a number of specific quantitative targets for 2020 and 2030 for passenger and freight transport, resulting in a substantial reduction in the proportion of passenger and freight transport on the road and an increase in transport via rail, sea and air. Furthermore, a number of taxation schemes were put in place within the framework of the Turkish Automotive Sector Strategy Paper and Action Plan, mainly targeting old road vehicles and promoting the use of more environmentally friendly vehicles.

43. The NC7 includes information on how Turkey promotes and implements the decisions of the International Civil Aviation Organization and the International Maritime Organization to limit emissions from aviation and marine bunker fuels. With regard to maritime transport, Turkey reported that it has been working on the necessary institutional, administrative and technical preparations with a view to complying with the decision on the amendments to MARPOL Annex VI on data collection systems for ship fuel oil consumption. To limit the environmental impacts from the sector, the Ministry of Transport and Infrastructure developed the Green Port Project in 2013. With regard to aviation, the Ministry of Foreign Affairs and the Ministry of Transport and Infrastructure are responsible for implementing the decisions taken by the International Civil Aviation Organization. In this context, Turkey submitted its voluntary intention to reduce CO_2 emissions from international aviation in the first pilot phase of the Carbon Offsetting and Reduction Scheme for International Aviation[6] scheme (2021–2027), the aim of which is to keep international CO_2 emissions from aviation at the 2020 level.

44. **Industrial sector**. In the industrial sector, a number of policies were deployed with the aim of improving efficiency and innovation, including the Turkish Industrial Strategy

[6] See https://www.icao.int/environmental-protection/CORSIA/.

Document and Action Plan (2015–2018) and its related National Eco-Efficiency Programme, which aims to promote eco-efficiency by raising awareness and providing support to businesses, and the Financial Support Scheme for Energy Efficiency Projects in Manufacturing Industry, aimed at supporting energy efficiency interventions by industries that use a minimum of 1,000 tep/year. As a result of the implementation of several such policies, energy efficiency in the industrial sector improved by 24.7 per cent overall between 2000 and 2016.

(c) Policies and measures in other sectors

45. **Industrial processes**. This sector is becoming increasingly important for Turkey. GHG emissions from the IPPU sector represented 12.6 per cent of the Party's total anthropogenic GHG emissions in 2016, amounting to 62.4 Mt CO_2 eq, a substantial increase compared with the 1990 level of 22.94 Mt CO_2 eq. However, Turkey did not report on any PaMs that specifically address GHG emissions from the IPPU sector.

46. **Agriculture**. In its NC7, Turkey explained that the agriculture sector plays a particularly important role in the country's economic and rural development. Turkey's goals for 2023 include becoming one of the top five agricultural producers at the global level and reaching an agricultural GDP of USD 150 billion. In the light of the expected growth in agricultural production, Turkey aims to put in place a number of PaMs to reduce GHG emissions from the sector, such as those outlined in its INDC, which include land consolidation in agricultural areas, rehabilitation of grazing lands, controlling the use of fertilizers and implementing modern agricultural practices. However, further details and quantitative information would be needed to evaluate whether those PaMs would be sufficient to control the increase in GHG emissions that is to be expected to result from the growth in agricultural production.

47. **LULUCF**. In its NC7, Turkey reported an increasing trend in forest stock over the last few decades. Most PaMs targeting sustainable forest management are included in the cross-cutting PaMs, such as the Tenth Development Plan, the National Climate Change Action Plan (2011–2023) and the National Strategy and Action Plan to Combat Desertification (2015–2023). The Strategic Plan of the General Directorate of Forestry set the goal of increasing the size of productive forest areas, while the National Forestry Programme aims to expand and improve existing forest areas and carbon sinks and promote economic, social and cultural activities that rely on forests. Specific goals were also included in Turkey's INDC, such as increasing sink areas, preventing land degradation and implementing the Action Plan on Forestry Rehabilitation.

48. **Waste management**. Although waste management accounts for only a minor share of its GHG emissions, Turkey considers actions in the waste sector to be particularly important because of its effects on environmental protection and public health. Actions in the waste sector with a positive impact on climate change mitigation are set out in most of Turkey's cross-cutting PaMs, such as the Tenth Development Plan, the National Climate Change Strategy (2010–2023) and Action Plan, and the INDC. Further specific measures are addressed in other policy documents. For instance, as part of its National Waste Management and Action Plan (2016–2023), Turkey estimated that it would require investment for additional waste management facilities in the region of EUR 1.7–2.9 billion. Furthermore, the National Waste Management and Action Plan sets a number of medium- and long-term targets, the first of which, for 2023, includes achieving a 35 per cent share of recycled waste, increasing the recovery rate of municipal waste to 8 per cent, increasing the recycling rate of municipal waste to 4–11 per cent and increasing the share of packaged waste separated at source to 12 per cent.

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

49. In the NC7, Turkey 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, 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.

50. As a Party included in Annex I to the Convention with no commitments inscribed in Annex B to the Kyoto Protocol, Turkey has no obligation to report on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol.

(e) Assessment of adherence to the reporting guidelines

51. The ERT assessed the information reported in the NC7 of Turkey and identified issues relating to completeness and transparency. The findings are described in table 7.

Table 7
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 Turkey

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement[a] specified in paragraph 14 Issue type: transparency Assessment: encouragement	In its NC7, Turkey did not provide clear information on how it gives priority to PaMs or combinations of PaMs with the most significant impact on GHG emissions and removals. For example, Turkey does not provide quantitative information on how its PaMs impact GHG emissions and how such information was used to prioritize its PaMs. Therefore, the ERT could not assess which of the PaMs reported were considered to have the biggest mitigation potential. During the review, Turkey explained that, in its NC7, it considered the PaMs that make the most significant contribution to its emission reduction efforts. It also explained that the energy sector produces most of its GHG emissions and, accordingly, PaMs implemented and planned in the energy sector are expected to have the most significant impact on GHG emission reductions, in particular the PaMs to increase renewable energy and energy efficiency and add nuclear power plants to the energy portfolio. The ERT reiterates the encouragement made in the previous review report that Turkey give priority to the PaMs or combinations of PaMs with the most significant impact on GHG emissions and removals.
2	Reporting requirement[a] specified in paragraph 14 Issue type: completeness Assessment: encouragement	Turkey did not indicate which PaMs are considered to be particularly innovative and/or effectively replicable by other Parties. During the review, Turkey explained that all of its implemented PaMs are considered to be replicable by other Parties. The ERT encourages Turkey to indicate any PaMs that are innovative and/or effectively replicable by other Parties.
3	Reporting requirement[a] specified in paragraph 16 Issue type: transparency	Turkey did not provide transparent information on how it periodically updates PaMs that encourage activities that lead to greater levels of anthropogenic GHG emissions, such as identifying which PaMs lead to greater levels of emissions and developing a plan for updating such PaMs, including expected emission impacts. The NC7 mentions several PaMs in the energy sector that could have this effect, such as the Tenth Development Plan, the objective of

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Assessment: encouragement	which is to reach "a competitive energy system which makes use of the local and renewable energy resources at the highest level", and the Strategic Plan of the Ministry of Energy and Natural Resources, which aims to reach "an optimum resource diversity by increasing local coal usage" and to increase "the local crude oil production and exploration of new local coal source mines". During the review, Turkey explained that, in the light of the reduction in imports of coal and natural gas, the aim of the National Energy and Mining Policy is to increase the share of domestic coal in the total coal portfolio in such a manner as to avoid any negative impact on human health and the environment by using the latest technologies, while keeping the share of coal in the energy portfolio at around the same level in the medium to long term. The ERT reiterates the encouragement made in the previous review report that Turkey improve the transparency of its reporting by providing information on actions taken to identify and periodically update its PaMs and practices that encourage activities that lead to greater levels of anthropogenic GHG emissions than would otherwise occur. The ERT notes that the rationale for these actions should also be presented.
4	Reporting requirement[a] specified in paragraph 17 Issue type: transparency Assessment: recommendation	The ERT noted that some of the textual descriptions of PaMs by sector are not fully consistent with the information in the relevant tables for the respective sectors. Moreover, a tabular description of cross-cutting PaMs and of PaMs in the buildings sector was not provided. During the review, Turkey provided additional information that improved the consistency of the descriptions of PaMs provided in textual and tabular format, and specified that only those PaMs that are expected to have a direct impact on emission reductions in the relevant sectors are reported in the tables. The ERT reiterates the recommendation made in the previous review report that Turkey report a consistent set of PaMs in the textual and tabular parts of its next NC.
5	Reporting requirement[a] specified in paragraph 23 Issue type: completeness Assessment: encouragement	Turkey did not provide quantitative estimates of the impacts of PaMs in CO_2 eq for 2020 and 2030 in its NC7 (in tables 4.4, 4.6, 4.8, 4.10, 4.12 and 4.13). During the review, Turkey explained that the total mitigation impacts of its PaMs were specified in its INDC, covering several years, including 2020 and 2030. The ERT considers that such information does not address the specific requirement set out in the UNFCCC reporting guidelines on NCs as the information is not provided at the level of individual PaMs. The ERT reiterates the encouragement made in the previous review report that Turkey improve the completeness of its reporting by including in its next NC quantitative estimates of the impacts of individual PaMs or sets of PaMs, or clearly explain why this may not be possible due to its national circumstances.
6	Reporting requirement[a] specified in paragraph 24 Issue type: completeness	Turkey provided information on the costs of some projects implemented to support PaMs. However, it did not provide information on the costs of PaMs considered under the WEM scenario. Turkey also did not report systematic information on the interaction of PaMs at the national level, such as how PaMs complement each other to enhance overall GHG mitigation.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Assessment: encouragement	During the review, Turkey explained that the cost of PaMs under the WEM scenario is currently being reviewed. It also explained that CCAMCB was established in 2001 with the responsibility of determining PaMs that address climate change. However, no information was provided as to how PaMs complement each other to enhance overall GHG mitigation. The ERT encourages Turkey to add information in its next NC on the cost of the PaMs reported, accompanied by a brief definition of the term "cost" and to report information on how PaMs complement each other to enhance overall GHG mitigation.
7	Reporting requirement[a] specified in paragraph 25 Issue type: completeness Assessment: recommendation	The NC7 does not include the required information on how PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in line with the objective of the Convention. The ERT noted that the section of the NC7 on projections includes a WEM scenario, projecting GHG emissions up to 2020 and 2030, including PaMs implemented, adopted or planned between 2012 and 2030; however, this is not enough to demonstrate how Turkey's PaMs are modifying longer-term trends (e.g. to 2050). During the review, Turkey informed the ERT that information on how PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals is provided in its INDC under the WEM and WOM scenario, and is also included in chapter 5 of the NC7. The ERT reiterates the recommendation made in the previous review report that Turkey include in its next NC information on how PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in line with the objective of the Convention.
8	Reporting requirement[a] specified in paragraph 26 Issue type: transparency Assessment: encouragement	Based on the information reported in the NC7 the ERT was unable to assess whether there were any PaMs that were listed in previous NCs that are no longer in place as Turkey did not provide any explicit information. During the review, Turkey explained that it provided the start year for most of the PaMs contained in the NC7 and that, unless an end date was stated, all PaMs indicated should be considered as still being implemented. The ERT encourages Turkey to identity which PaMs listed in previous NCs are no longer in place and explain why this is so.
9	Reporting requirement[b] specified in paragraph 36 Issue type: completeness Assessment: recommendation	In its NC7, Turkey did not provide information on how it strives to implement PaMs under Article 2 of the Kyoto Protocol in such a way as to minimize adverse effects. The NC7 included only a very short paragraph (in chapter 4.3.4.2) stating that PaMs are implemented in such a way as to minimize adverse effects, but did not include any information on how this is done. The Party did not provide any further information during the review. The ERT recommends that Turkey include in its next NC 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, effects on international trade, and social, environmental and economic impacts on other Parties, especially developing country Parties and in particular those identified in Article 4, paragraphs 8 and 9, of the Convention, taking into account Article 3.

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.

[a] Paragraph number listed under reporting requirement refers to the relevant paragraph of the UNFCCC reporting guidelines on NCs.

[b] 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

1. Projections overview, methodology and results

(a) Technical assessment of the reported information

52. Turkey reported projections for 2020 and 2030 relative to actual inventory data for 1990, 1995, 2000, 2005, 2010 and 2015 under the WEM scenario (defined in the NC7 as the "mitigation scenario").

53. The ERT noted that the PaMs reported in the NC7 (tables 4.4, 4.6, 4.8, 4.10 and 4.12) are not the ones included in the WEM scenario. According to information provided during the review, the WEM scenario reported in the NC7 is based on the PaMs listed in Turkey's INDC. The ERT also noted that the PaMs listed in Turkey's INDC do not include information on the objective, GHGs affected, type of instrument, status (implemented, planned), start year of implementation or implementing entities, or an estimate of the mitigation impact. Therefore, the ERT was not able to assess whether the WEM scenario reported by Turkey is in line with the UNFCCC reporting guidelines on NCs.

54. In addition to the WEM scenario, Turkey reported a WOM scenario (defined in the NC7 as the "business as usual scenario"). During the review, Turkey confirmed that the WOM scenario excludes all PaMs implemented and in effect since 2012.

55. The projections were carried out as part of the Preparation of Turkey's Sixth National Communication on Climate Change project, implemented by the Ministry of Environment and Urbanization and the Marmara Research Center from the Scientific and Technological Research Council of Turkey, and constituted the basis for Turkey's INDC.

56. 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_2, CH_4, N_2O, PFCs and HFCs, SF_6 and NF_3 for the period 1990–2030. 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 AR4.

57. Turkey did not report emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides.

58. Emission projections related to fuel sold to ships and aircraft engaged in international transport were not reported and, according to the information provided by Turkey during the review, were not included in the totals. Turkey did not report on factors and activities affecting emission projections for each sector.

59. Turkey has made some improvements to its reporting since the NC6, such as by reporting separate information on emission projections related to the transport sector and by providing a short summary of the TIMES-MACRO model (see para. 60 below).

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

60. Turkey reported that a TIMES-MACRO model was used for the projections for energy consumption in the energy and IPPU sectors ("energy emissions"). For the remaining sectors ("non-energy emissions"), Turkey reported that different national models and studies were used, without providing any further details.

61. The mathematical modelling approach for energy emissions was deployed using the TIMES energy system model from the Energy Technology Systems Analysis Program of the International Energy Agency.[7] This bottom-up, linear dynamic model has the objective of total cost minimization under a given set of constraints (e.g. demand levels, GHG limits).

62. Turkey did not report explicitly on the methodologies used for projecting non-energy emissions, and no references for the modelling approaches were reported.

[7] See https://iea-etsap.org/.

63. The methodology used for the preparation of the projections for the NC7 is identical to that used for the NC6 and has not been updated since then.

64. To prepare its projections, Turkey relied on key underlying assumptions of population and GDP growth. These variables and assumptions were reported in CTF table 5. The assumptions were not updated on the basis of the most recent economic developments known at the time of the preparation of the projections.

65. Turkey did not report information on other underlying assumptions, such as electricity demand and energy intensity in the residential and commercial sectors, that were used for the projections. Also, Turkey did not provide information on any sensitivity analyses conducted.

(c) Results of projections

66. The projected emission levels under the WEM and WOM scenario are presented in table 8 and the figure below. Owing to its special circumstances, Turkey does not have a target under the Kyoto Protocol or a quantified economy-wide emission reduction target under the Convention. Therefore, the results of the projections are not compared with a target. Turkey submitted an INDC of a reduction in GHG emissions including LULUCF of up to 21 per cent compared with the WOM projection by 2030.

67. Under the WEM and WOM scenario, GHG emissions including LULUCF are projected to be 229.6 and 270.1 per cent, respectively, above the 1990 level in 2020, and 411.0 and 546.2 per cent, respectively, above the 1990 level in 2030. The ERT noted that the projected increase in GHG emissions including LULUCF in 2015–2030 (189.2 per cent) is very high compared with the increase in 1990–2015 (123.5 per cent). During the review, Turkey explained that the increase in emissions projected for 2015–2030 is mainly due to rising energy demand and that further details could not be reported for confidentiality reasons. As details on some key underlying assumptions used in projections, including quantitative information on projected energy demand, were not reported in the NC7, the ERT was not able to conduct a comprehensive assessment on the projection trends reported by Turkey.

68. According to the information provided by Turkey during the review, the WOM scenario can be updated at any time and, therefore, the reduction in emissions of up to 21 per cent compared with the WOM projection by 2030 set in the INDC (see para. 66 above) cannot be fixed in terms of an absolute amount of CO_2 eq. During the review, Turkey informed the ERT that it was currently projecting new WEM and WOM scenarios.

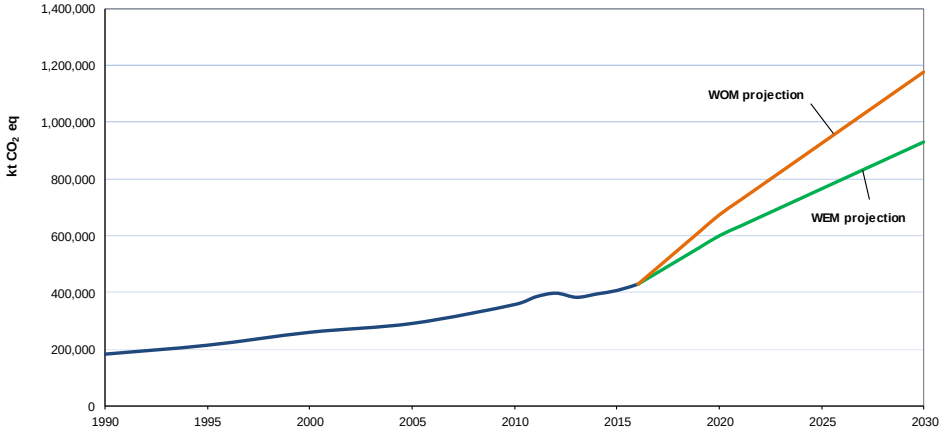
Table 8
Summary of greenhouse gas emission projections for Turkey

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year level (%)*	*Changes in relation to 1990 level (%)*
Kyoto Protocol base year[a]	NA	NA	NA
Quantified emission limitation or reduction commitment under the Kyoto Protocol (2013–2020)[a]	NA	NA	NA
Quantified economy-wide emission reduction target under the Convention	NA	NA	NA
Inventory data 1990[b]	181 792.04	NA	0.0
Inventory data 2015[b]	406 261.50	NA	123.5
WOM projections for 2020[b]	672 900.80	NA	270.1
WEM projections for 2020[b]	599 216.89	NA	229.6
WOM projections for 2030[b]	1 174 780.58	NA	546.2

	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year level (%)*	*Changes in relation to 1990 level (%)*
WEM projections for 2030[b]	928 987.17	NA	411.0

Note: The projections are for GHG emissions including LULUCF.
[a] Turkey does not have a target under the Kyoto Protocol or an emission reduction target under the Convention.
[b] From Turkey's BR3 CTF table 6.

Greenhouse gas emission projections reported by Turkey



Source: Turkey's BR3 CTF tables; total GHG emissions including LULUCF.

69. Turkey's reported projections of total GHG emissions for 2020 and 2030 show an increasing emission trend. Its total GHG emissions including LULUCF are projected to be 599,216.89 and 928,987.17 kt CO_2 eq in 2020 and 2030, respectively, under the WEM scenario, which is an increase of 229.6 and 411.0 and per cent, respectively, above the 1990 level. According to the WEM scenario, GHG emissions including LULUCF are projected to be 20.9 per cent below the WOM scenario by 2030, which is in line with Turkey's INDC (reduction in GHG emissions of up to 21 per cent).

70. Turkey presented the WEM scenario by sector for 2020 and 2030, as summarized in table 9.

Table 9
Summary of greenhouse gas emission projections for Turkey presented by sector

	GHG emissions and removals (kt CO_2 eq)			*Change (%)*	
		2020	*2030*	*1990–2020*	*1990–2030*
Sector	*1990*	*WEM*	*WEM*	*WEM*	*WEM*
Energy (not including transport)	107 359.00	398 222.71	602 271.38	270.9	461.0
Transport	26 968.90	101 112.82	135 994.48	274.9	404.3
Industry/industrial processes	22 893.94	94 750.20[a]	169 753.80	314.0	641.5
Agriculture	42 402.30	51 557.04	59 277.89	21.6	39.8
LULUCF	–28 922.68	–70 035.88	–69 710.38	142.1	141.0
Waste	11 090.59	23 610.00	31 400.00	112.9	183.1
Total GHG emissions without LULUCF	**210 714.73**	**669 287.77**	**998 697.55**	**217.6**	**374.0**
Total GHG emissions with LULUCF	**181 792.04**	**599 216.89**	**928 987.17**	**229.6**	**411.0**

Source: Turkey's BR3 CTF table 6.
[a] Value provided by Turkey during the review.

71. According to the projections reported for 2020 under the WEM scenario, emissions are expected to increase, especially in the energy, transport and IPPU sectors. Net removals from the LULUCF sector are expected to increase by around 142.1 and 141.0 per cent by 2020 and 2030, respectively. The pattern of projected emissions reported for 2030 under the same scenario remains virtually the same. The ERT noted that the IPPU sector becomes more important than the transport sector in terms of absolute emissions in 2030. As Turkey did not report all key underlying assumptions or all PaMs, the ERT cannot assess the reasons for the differences in projection trends between the two time frames.

72. Turkey presented the WEM scenario by gas for 2020 and 2030, as summarized in table 10.

Table 10
Summary of greenhouse gas emission projections for Turkey presented by gas

	GHG emissions and removals (kt CO_2 eq)			*Change (%)*	
		2020	*2030*	*1990–2020*	*1990–2030*
Gas	*1990*	*WEM*	*WEM*	*WEM*	*WEM*
CO_2	117 526.58	494 057.44	790 338.43	320.4	572.5
CH_4	42 203.66	71 214.67	91 824.92	68.7	117.6
N_2O	21 436.50	25 170.91	31 104.62	17.4	45.1
HFCs	NO	7 504.22	13 444.50	NA	NA
PFCs	625.30	NE	NE	NA	NA
SF_6	NO	1 269.65	2 274.70	NA	NA
NF_3	NO	NE	NE	NA	NA
Total GHG emissions with LULUCF	**181 792.04**	**599 216.89**	**928 987.17**	**229.6**	**411.0**
Total GHG emissions without LULUCF	**210 714.73**	**669 252.77**	**998 697.55**	**217.6**	**374.0**

Source: Turkey's BR3 CTF table 6. Figures for CO_2, CH_4 and N_2O include emissions from LULUCF.

73. For 2020, CO_2 emissions without LULUCF are projected to increase by 564,093.32 kt CO_2 eq (285 per cent) between 1990 and 2020.

74. For 2030, CO_2 emissions without LULUCF are projected to increase by 860,048.81 kt CO_2 eq (487 per cent) between 1990 and 2030.

(d) Assessment of adherence to the reporting guidelines

75. The ERT assessed the information reported in the NC7 of Turkey and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on NCs. The findings are described in table 11.

Table 11
Findings on greenhouse gas emission projections reported in the seventh national communication of Turkey

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 28	The ERT noted that Turkey did not report a WAM scenario in its NC7.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Issue type: completeness	During the review, Turkey explained that several scenarios will be prepared during the update of its INDC and that those scenarios will probably be included in its next NC.
	Assessment: encouragement	The ERT encourages Turkey to report a WAM scenario in its next NC.
2	Reporting requirement specified in paragraph 29	The ERT noted that, based on the information from the NC7, it was not clear which PaMs (adopted, implemented) were included in the WEM scenario and whether Turkey had erroneously also included planned PaMs.
	Issue type: transparency	During the review, Turkey explained that the PaMs considered in the WEM projections were those reported in its INDC and not the PaMs reported in the NC7 (tables 4.4, 4.6, 4.8, 4.10 and 4.12). The ERT noted that no information was provided on the status of implementation of PaMs in Turkey's INDC.
	Assessment: recommendation	The ERT recommends that Turkey provide a WEM projection with currently implemented and adopted PaMs. The ERT notes that, in order to increase reporting transparency, Turkey needs to specify the status of the PaMs included in the WEM scenario.
3	Reporting requirement specified in paragraph 30	The ERT noted that Turkey did not report a sensitivity analysis for its projections in the NC7.
	Issue type: completeness	During the review, Turkey explained that several scenarios will be prepared during the update of its INDC and that those scenarios will probably be included in its next NC.
	Assessment: encouragement	The ERT reiterates the encouragement made in the previous review report that Turkey report a sensitivity analysis for its projections in the next NC.
4	Reporting requirement specified in paragraph 35	The ERT noted that Turkey did not report in its NC7 projections of indirect GHGs (carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides).
	Issue type: completeness	During the review, Turkey explained that several scenarios will be prepared during the update of its INDC and that these scenarios will probably be included in the next NC but did not elaborate on projections of indirect GHGs.
	Assessment: encouragement	The ERT encourages Turkey to report projections of indirect GHGs in its next NC.
5	Reporting requirement specified in paragraph 36	The ERT noted that Turkey did not report information on emission projections related to fuel sold to ships and aircraft engaged in international transport.
	Issue type: completeness	During the review, Turkey clarified that it had not prepared emission projections related to fuel sold to ships and aircraft engaged in international transport and, hence, those emissions were not included in the totals.
	Assessment: recommendation	The ERT reiterates the recommendation made in the previous review report that Turkey improve its reporting by reporting separately and without including in the totals, to the extent possible, emission projections related to fuel sold to ships and aircraft engaged in international transport.
6	Reporting requirement specified in paragraph 37	The ERT noted from the NC7 (pp.119–121) that the emissions projected for 2020 for the IPPU sector under the WEM scenario (94,785.20 kt CO_2 eq) were higher than those under the WOM scenario (94,750.20 kt CO_2 eq).
	Issue type: transparency	During the review, Turkey informed the ERT that the emission projection for the IPPU sector in 2020 is 94,750.20 kt CO_2 eq under both the WEM and the WOM scenario.
	Assessment: encouragement	The ERT encourages Turkey to ensure that the quantitative information on projections is correct and to correct the emission projection reported for the IPPU sector for 2020 under the WEM scenario.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
7	Reporting requirement specified in paragraph 38 Issue type: transparency Assessment: encouragement	The ERT noted that Turkey did not use the same data presented in tabular format in the NC7 (tables 5.2 and 5.3) for the diagram illustrating the WEM and WOM projections (figure 5.1 of the NC7), specifically the data concerning GHG emissions in 1990–2015. During the review, Turkey explained that the historical data for GHG emission trends for 1990–2015 had been updated and that the update is reflected in tables 5.2 and 5.3 but not in figure 5.1 of the NC7. The ERT encourages Turkey to correct the diagram on emission projections using the same data reported in tabular format.
8	Reporting requirement specified in paragraph 42 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not provide sufficient information in the NC7 to enable a basic understanding of the models and approaches used to project emissions. The information in the NC7 states only that the "TIMES-MACRO model has been used for energy-related modelling and industrial processes and product use, while for non-energy emissions different national models and studies have been used". During the review, Turkey explained that further information could not be provided for confidentiality reasons. The ERT reiterates the encouragement made in the previous review report that Turkey provide information that enables the reader to obtain a basic understanding of the models and approaches used to project GHG emissions and removals.
9	Reporting requirement specified in paragraph 43 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not (1) describe the type of model or approach used and its characteristics (for example, top-down model, bottom-up model, accounting model, expert judgment); (2) describe the original purpose the model or approach was designed for and, if applicable, how it was modified for climate change purposes; (3) summarize the strengths and weaknesses of the model or approach used; and (4) explain how the model or approach used accounted for any overlaps or synergies that may exist between different PaMs. During the review, Turkey explained that further information could not be provided for confidentiality reasons. The ERT reiterates the encouragement made in the previous review report that Turkey include the information listed above for each model or approach used.
10	Reporting requirement specified in paragraph 44 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not provide in the NC7 references to more detailed information for any of the models or approaches used for the emission projections. During the review, Turkey explained that the model was developed by experts from Işık University and Bosphorus University, and that further information could not be provided for confidentiality reasons. The ERT encourages Turkey to include references to more detailed information for each model and approach used for the emission projections in its next NC.
11	Reporting requirement specified in paragraph 46 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not qualitatively or quantitatively discuss the sensitivity of the projections to the underlying assumptions. During the review, Turkey explained that further information could not be provided for confidentiality reasons. The ERT reiterates the encouragement made in the previous review report that Turkey qualitatively and, where possible, quantitatively discuss in its next NC the sensitivity of the projections to the underlying assumptions.
12	Reporting requirement specified in paragraph 47	The ERT noted that Turkey did not provide information on all key underlying assumptions and values of variables, including tax levels, fuel prices, energy demand and intensity, income and household size. The lack of information on key

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Issue type: transparency Assessment: encouragement	underlying assumptions, aside from population and GDP growth, makes it difficult to review the emission trends for the various sectors under both the WEM and the WOM scenario. During the review, Turkey explained that further information could not be provided for confidentiality reasons. The ERT reiterates the encouragement made in the previous review report that Turkey provide information on key underlying assumptions and values of variables such as tax levels, fuel prices, energy demand and intensity, income and household size.
13	Reporting requirement specified in paragraph 48 Issue type: completeness Assessment: recommendation	The ERT noted that Turkey did not provide in its NC7 information on factors and activities for each sector, such as energy sources and electricity supply, that would provide the reader with an understanding of the emission trends in 1990–2020 and 1990–2030. During the review, Turkey explained that further information could not be provided for confidentiality reasons. The ERT recommends that Turkey provide relevant information on factors and activities for each sector in order to provide the reader with an understanding of the emission trends in 1990–2020 and 1990–2030.
14	Reporting requirement specified in paragraph 48 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not report in its NC7 information on factors and activities for each sector in tabular format that would provide the reader with an understanding of the emission trends in 1990–2020 and 1990–2030. During the review, Turkey explained that further information could not be provided for confidentiality reasons. The ERT encourages Turkey to report relevant information on factors and activities for each sector in tabular format in its next NC.

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

76. In the NC7 Turkey did not present the estimated and expected total effect of implemented and adopted PaMs. However, the ERT estimated the expected total effect of PaMs on the basis of the difference between the WOM and WEM projections reported in the NC7.

77. The total estimated effect of PaMs calculated on the basis of the difference between the WOM and WEM projections is 73,683.91 and 245,793.41 kt CO_2 eq in 2020 and 2030, respectively, including LULUCF, and 43,841.29 and 214,781.16 kt CO_2 eq in 2020 and 2030, respectively, excluding LULUCF.

78. According to the information reported in the NC7, the energy, LULUCF and waste sectors will deliver the largest emission reductions in 2020 and 2030. The ERT noted that emissions for the agriculture and IPPU sectors in 2020 and 2030 are projected to be the same in both the WEM and the WOM projection, suggesting that the effect of PaMs on those sectors was not considered in the projections. The ERT also noted that the effect of PaMs on HFCs and SF_6 in 2020 and 2030 was not projected. Table 12 provides an overview of the effect of PaMs in the energy sector as reported by Turkey.

Table 12
Projected effects of Turkey's planned, implemented and adopted policies and measures by 2020

	2020	
Sector	*Effect of implemented and adopted measures (kt CO_2 eq)*	*Effect of planned measures (kt CO_2 eq)*
Energy (without transport)	NE	NE
Transport	NE	NE
Industrial processes	NE	NE
Agriculture	NE	NE
Land-use change and forestry	NE	NE
Waste management	NE	NE
Total	**NE**	**NE**

Source: Turkey's NC7.

(b) Assessment of adherence to the reporting guidelines

79. The ERT assessed the information reported in the NC7 of Turkey and identified issues relating to completeness and transparency. The findings are described in table 13.

Table 13
Findings on the assessment of the total effect of policies and measures from the review of the seventh national communication of Turkey

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 39 Issue type: completeness Assessment: recommendation	The ERT noted that Turkey did not report the estimated and expected total effect of implemented and adopted PaMs in its NC7. During the review, Turkey explained that the PaMs considered under the WEM scenario were those reported in its INDC and not the PaMs reported in the NC7 (tables 4.4, 4.6, 4.8, 4.10 and 4.12). The ERT noted that neither the INDC nor the NC7 provide information about the status of implementation of the PaMs or the estimated impact on GHG emissions. The ERT reiterates the recommendation made in the previous review report that Turkey report the estimated and expected total effect of implemented and adopted PaMs in its next NC.
2	Reporting requirement specified in paragraph 39 Issue type: completeness Assessment: encouragement	The Party did not report the total expected effect of planned PaMs in its NC7. During the review, Turkey explained that further information could not be provided for confidentiality reasons. The ERT reiterates the encouragement made in the previous review report that Turkey report the total expected effect of planned PaMs in its next NC.
3	Reporting requirement specified in paragraph 40 Issue type: completeness	The ERT noted that Turkey did not provide an estimate of the total effect of PaMs in accordance with the WEM definition compared with a situation without such PaMs, presented in terms of GHG emissions avoided or sequestered.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Assessment: recommendation	During the review, Turkey explained that it faced challenges in providing further information on the total effect of the adopted and implemented PaMs, including the mitigation impact of individual PaMs adopted by the Party. The ERT reiterates the recommendation made in the previous review report that Turkey estimate the total effect of PaMs in accordance with the WEM definition compared with a situation without such PaMs.

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.

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

80. Turkey 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.

E. Vulnerability assessment, climate change impacts and adaptation measures

1. Technical assessment of the reported information

81. In the NC7, Turkey provided the required information on the expected impacts of climate change in the country and on its adaptation policies. Compared with Turkey's NC6, the ERT noted that Turkey provided more comprehensive and transparent information on the action taken to implement Article 4, paragraph 1(b) and (e), of the Convention with regard to adaptation.

82. Turkey provided a description of climate change vulnerability and the impacts on water resources, agriculture and food security (including fisheries and aquaculture), extreme weather events and disasters, ecosystems and biodiversity, coastal areas, human health, settlement areas and tourism, and highlighted the adaptation response actions taken and planned at different levels of government. Additionally, Turkey reported integrated plans and projects for coastal zone, water resources and agricultural management.

83. Impetus has been given to addressing adaptation matters with the adoption of the Strategic Environmental Assessment (By-Law No. 30032) in 2017 and the National Climate Change Action Plan (2011–2023), which provided further direction to government agencies on enhancing preparedness for climate change.

84. In 2017, Turkey started the Enhancing Required Joint Efforts on Climate Action Project to increase public awareness and enhance stakeholder capacity to combat climate change. Through its former Ministry of Agriculture and Forestry, General Directorate of Water Management and Department of Flood and Drought Management, Turkey has carried out studies within the framework of the Impact of Climate Change on Water Resources Project. These studies, covering 25 river basins across Turkey, aimed to identify the impacts of climate change on surface and groundwater using a basin-scale approach and to determine appropriate adaptation measures. The studies were conducted using a regional climate model coupled with the results from three global climate models, and made projections for the period 2015–2100 using the representative concentration pathway scenarios from the AR5, namely the moderate radiative forcing and high radiative forcing scenarios. The studies have produced, for example, surface flow data for all basins resulting from a hydrologic model, water level values and river system for all basins, and amounts of groundwater and surface water potential for all basins for the projected period.

85. Turkey also reported on coastal zone adaptation studies carried out under its Determination and Classification of Sea and Coastal Waters Project (2011–2014). These

studies aimed to generate information and tools to support coastal area management using an ecosystem approach. Among other things, the studies provided a definition of Turkey's coastal and transitional waters, determined coastal water typologies and water management units, and classified coastal waters.

86. Turkey is among the group of at-risk countries predicted to experience an increase in climate change related natural disasters such as floods, forest fires, storms, hail, heatwaves, landslides and avalanches. According to Turkey's Ministry of Environment and Urbanization, the observed decrease in precipitation and increase in temperature will lead to a decreasing trend in flows in some river basins, leading to an extreme scarcity of water for users in agricultural, industrial and residential areas.

87. Turkey further reported that the increase in mean air temperature may lead to soils drying out, dry winter months and increased sudden and/or short extreme precipitation and hail events in the spring, which, in turn, may adversely affect agricultural production and food security in the country. Model predictions show reductions in the amount of water per capita of 16 and 27 per cent, respectively, by 2050 and 2075.

88. The ERT noted that Turkey provided in its NC7 (sections 8 and 9) a detailed description of international adaptation activities, including the FAO-Turkey Partnership Programme, which aims to provide funding for forest management projects in Africa and Central Asia, and Africa's Great Green Wall Project. Moreover, Turkey provided information on bilateral cooperation with developing countries on adaptation in combating desertification, floods and erosion and offsetting land degradation. However, this information was not reported or referenced in the section of the NC7 on vulnerability assessment, climate change impacts and adaptation.

89. Table 14 summarizes the information on vulnerability and adaptation to climate change presented in the NC7 of Turkey.

Table 14
Summary of information on vulnerability and adaptation to climate change reported by Turkey

Vulnerable area	*Examples/comments/adaptation measures reported*
Agriculture and food security	*Vulnerability*: The gradual increase in mean temperature and changes in the precipitation cycle may lead to large losses in agricultural production systems. There are predicted to be changes in production patterns and cultivation areas by region and increases in yield losses due to increases in the occurrence and severity of extreme weather events such as drought, floods and hail. Studies based on climate change projections predict a 7.6, 10.1, 3.8 and 6.5 per cent decrease in yield for wheat and barley, corn, cotton and sunflower, respectively, in 2050. Food production in many areas will be affected by climate change induced factors such as desertification and an increased fire risk, thereby threatening food security. Livestock production will be affected directly and indirectly by drought, floods, landslides, crop yield losses and temperature-related stress. *Adaptation*: Turkey's Strategy of Fighting Agricultural Drought and Action Plan (2018–2022); providing up-to-date satellite-monitored and ground measurement network information to stakeholders for agricultural warnings, irrigation management and decision support through the Agricultural Monitoring and Information System Project (the pilot phase has been implemented with 100 stations); educating and training agricultural plant owners on food security and soil protection through the Developing Agricultural Publication Project (2007–2013); and combating desertification and erosion with the cooperation of non-governmental organizations and through Turkey's National Strategy and Action Plan to Combat Desertification (2015–2023). With respect to fisheries and aquaculture, Turkey has completed limnological studies for 287 dams and implemented a series of projects in aquaculture production and sustainable fish farming in dam lakes and ponds through its General Directorate of State Hydraulic Works.
Ecosystems and biodiversity	*Vulnerability*: Changes in the temperature and precipitation regime will change ecosystem structure and functions. Species with restricted habitats and sensitive ecosystems are thought to be the most vulnerable to climate change impacts. It is expected that there will be loss of area and volume of inland water bodies, decreasing fresh water resources, decreases in currents and flow rates and a deterioration of

Vulnerable area	*Examples/comments/adaptation measures reported*
	biological diversity and habitats. Agricultural and forest ecosystems are being affected by drought and desertification, which is expected to continue in the future given the decreasing precipitation trend observed. A 1 ºC increase in temperature will affect the composition of forest species. Reductions in relative humidity and increases in temperature increase the likelihood of forest fires. Plant and animal species may migrate to more favourable ecological areas.
	Adaptation: For the effective management and protection of ecosystems and biological diversity, Turkey has prepared the National Biological Diversity Strategy and Action Plan (in accordance with Article 6 of the Convention and EU regulations), the Protected Areas and Climate Change National Strategy of Turkey (2011), the Lakes and Wetlands Action Plan (2017–2023) and the General Directorate of Forestry Strategic Plan (2017–2021). Some of Turkey's implemented projects on ecosystem and biodiversity protection include: Decreasing the Effects of Climate Change and Sustainable Usage of Biological Diversity and the Wetlands in Turkey in Order to Protect Them (2009–2011); Determining the Climate Change Decreasing Potentials of Yeniçağa Lake (Bolu) and Akgöl (Konya) Wetlands (2012); Reinforcement of Protected Areas System in Turkey: Generalizing the Sustainability of Sea Shore Protection Areas Project (2009–2014); and the Wetland Management Plans Preparation (2011–2017) project.
Coastal zones	*Vulnerability*: Problems such as coastal erosion and floods occur on Turkey's coast and in the eastern Black Sea, North Aegean and East Mediterranean regions. Sea level rise resulting from climate change is expected to aggravate these problems.
	Adaptation: In mid-2018, Turkey completed its integrated coastal zone plans for about 82 per cent of its coastal zones. These provide strategies and policies for the integrated management of coastal zones, their interacting areas and coastal development plans.
Extreme weather events and disasters	*Vulnerability*: Turkey reported that studies indicate that climate change has increased the destructive capacity of meteorological events and is projected to aggravate such events further. The AR4 projects more frequent, severe and long-lasting droughts, heatwaves and forest fires for southern Europe, including Turkey. There has been a significant increase in the number of meteorological disasters since 2000, with a total of 731,654 and 698 reported in 2015, 2016 and 2017, respectively. Results from regional climatic models for Turkey show that such disasters will continue in the future, placing Turkey in the top three countries in Europe and Central Asia most exposed to extreme climatic events towards the end of the twenty-first century.
	Adaptation: Turkey has set up meteorological assessment and early warning systems to prepare for and minimize the effect of any occurring extreme weather event or disaster through TSMS. These systems comprise a flash flood early warning system, a lightning detection and tracking system, and a forest fire and meteorology early warning system. Turkey is the regional centre for the eight-member country Black Sea and Middle East Regional Flash Flood Early Warning System. The Flood Action Plan of the General Directorate of State Hydraulic Works (2014–2018) and the Turkey Disaster Response Plan have been implemented to ensure effective intervention. Turkey's Disaster Management Strategy Paper and Action Plan, and Disaster Risk Mitigation Plan are in the preparatory stages.
Fisheries	*Vulnerability*: Over the last few years, sea capture production has not been increasing despite large fishing efforts. Climate change is expected to aggravate this situation. Aquatic animals are highly sensitive to changes in the marine environment; therefore, damage to the fishery and aquaculture sectors due to climate change impacts such as increases in water temperature is inevitable.
	Adaptation: With respect to fisheries and aquaculture, Turkey has completed limnological studies for 287 dams and implemented a series of projects in aquaculture production and sustainable fish farming in dam lakes and ponds through its General Directorate of State Hydraulic Works.
Human health	*Vulnerability*: Climate change affects human health both directly and indirectly. Extreme weather events may lead to loss of life and extreme heatwaves may aggravate existing health conditions in children, elderly people and people with underlying health problems.

Vulnerable area	*Examples/comments/adaptation measures reported*
	Climate change can increase the number of disease-carrying vectors and rodents; in recent years, there has been an increase in cases of tularemia, malaria and Crimean-Congo haemorrhagic fever.
	Adaptation: Turkey has developed the National Program and Action Plan for Mitigating the Negative Impacts of Climate Change on Health, which aims to reduce the negative contribution of health institutions to climate change.
Infrastructure and economy	*Vulnerability*: Infrastructure and tourism are affected directly and indirectly by climate change related events such as temperature increase, changes in precipitation regime and wind velocity, heatwaves, heat island effects, tsunamis, flooding, coastal and soil erosion, biodiversity loss, landslides and drought.
	Adaptation: Development of the 2018–2022 Strategic Plan of the Ministry of Environment and Urbanization; development of the Planning Principles and Criteria in Urban Transformation Project, launched in 2017 and conducted as part of Law No. 6306 on the Transformation of Areas Under Disaster Risk; the Increasing the Institutional and Technical Capacity for Developing Climate Adaptation Strategies Project; the Istanbul Seismic Risk Mitigation and Emergency Preparedness Project; and Turkey's Tourism Strategy (2023) and Action Plan (2013), which seek to reduce the risks of climate change on the Mediterranean coastline by diversifying Turkey's tourist opportunities and destinations.
Water resources	*Vulnerability*: According to scientific predictions, the most significant impact of climate change in Turkey will be on the water cycle, leading to a decline in water resources. About 50 per cent of surface waters in the Gediz and Büyük Menderes basins may disappear, causing extreme water scarcity. A pessimistic scenario model projection shows 16 and 27 per cent reductions in Turkey's water potential by 2050 and 2075, respectively.
	Adaptation: A total of 788 dams and 470 ponds have been built since 2017 to increase water storage capacities and thus meet needs for potable, industrial and irrigation water. An additional 727 dams are planned to be built by 2023. To reduce the impacts of drought on agriculture, 170,000 ha land was irrigated between 2012 and 2014 as part of Turkey's first Lake-Water Project. For the second Lake-Water Project, there are plans to build 1,071 ponds and irrigate 250,000 ha land by the end of 2019. Since 2013, an integrated River Basin Management Plan has been implemented for 25 basins. Other adaptation measures include the By-Law on the Protection of Drinking-Utility Water Basins (issued in 2017); drought management action plans; drinking, domestic and industrial water supply action plan for 81 cities (2008–2012); building of 8,168 flood protection facilities and 68 dams; the Flood Action Plan of the General Directorate State Hydraulic Works; the Evaluation of the Reuse Alternatives of Used Waters Project (2017–2019); and the reuse of irrigation water in regions implementing good agricultural practices.

2. Assessment of adherence to the reporting guidelines

90. The ERT assessed the information reported in the NC7 of Turkey and identified issues relating to transparency. The findings are described in table 15.

Table 15
Findings on vulnerability assessment, climate change impacts and adaptation measures from the review of the seventh national communication of Turkey

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 49 Issue type: transparency	

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Assessment: recommendation	The Party reported on its international cooperation on adaptation activities in Africa and Central Asia focused on combating desertification, offsetting land degradation, floods, erosion and forest management projects. However, this information was not reported in the section on vulnerability assessment, climate change impacts and adaptation of the NC7, but rather in other sections of the NC7. During the review, Turkey referred the ERT to the sections of the NC7 where information on international cooperation on adaptation activities in Africa and Central Asia was included, namely in section 8, on research and systematic observation, and in section 9, on education, training and public awareness. The ERT recommends that Turkey include an outline of the actions taken to implement Article 4, paragraph 1(b) and (e) with regard to adaptation in the vulnerability and adaptation chapter of the NC or provide clear references to the other sections of the report where this information may be reported.

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

91. Turkey provided information on its general policy and institutional framework as well as actions relating to research and systematic observation, and reported on its domestic and international activities, including contributions to the World Climate Programme and the IPCC.

92. Turkey is continuing to carry out research and scientific studies that will feed into the AR6. Turkey also provided 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. In its NC7, Turkey identified gaps in information and communication technologies between it and other developed counties as a potential barrier to free and open international data exchange. However, the Party has put in place advanced technologies, such as data collection software, powerful computer systems for data processing and forecasting, and strong telecommunication networks, to close this gap and ensure that Turkey keeps up with the rapid technological developments.

93. TSMS is the custodian of Turkey's meteorological and related observational systems. It is the only legal organization that provides all meteorological information in Turkey. Measurement and observation data from stations across the country are transmitted to the domestic and observation units at TSMS, and also distributed globally.

94. TSMS contributes to global observation systems through its activities as a member of international organizations that support studies on global climate change, such as the World Meteorological Organization, the European Centre for Medium-Range Weather Forecasts, the European Organisation for the Exploitation of Meteorological Satellites and the Aire Limitée Adaptation dynamique Développement InterNational, and cooperates with other countries and international institutions for the integration and free, unrestricted sharing of observational data across borders.

95. As a member of the World Meteorological Organization, TSMS is actively involved in its programmes, such as the Global Observation System, the Global Climate Observation System, the Surface Radiation Network and the Global Atmospheric Watch.

96. Turkey 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. Within the call-based support programmes of Turkey's Supreme Council for Science and Technology, over 330 research

and development projects relating to climate change mitigation have been carried out in the past five years. National flagship projects within the scope of such programmes include the development of hydropower, wind and solar energy technologies.

97. Internationally, Turkish researchers were active in over 100 projects relating to energy and climate change within the EU 7th Framework Programme and Horizon 2020.

98. Turkey's Council of Higher Education has designed the 100/2000 programme, the aim of which is to help 2,000 people obtain doctorate degrees in 100 fields, focusing on priority areas such as urban transformation, renewable energy resources/technologies, hydrogen and fuel cells, climate change, sustainable forestry, remote sensing and geographic information systems. Using global models, TSMS produced scenarios based on representative concentration pathways 4.5 and 8.5[8] for Turkey for the period 2016–2099.

99. Turkey provided information on its efforts with regard to research and projects on climate process and studies, climate change impacts and response options, and research and development on mitigation and adaptation technologies. One such project was called Development of Climate Change-Ecosystem Services Software to Support Sustainable Land Planning Studies (2014–2018), sponsored by the Supreme Council for Science and Technology.

100. In terms of activities related to systematic observation, Turkey reported on national plans, programmes and support for ground- and space-based climate observing systems, including satellite and non-satellite climate observation. Turkey also reported on challenges related to the maintenance of a consistent and comprehensive observation system.

101. The NC7 reflects action taken to support capacity-building and the establishment and maintenance of observation systems and related data and monitoring systems in developing countries. Turkey provided funding for scientists from developing countries working on global climate change research. Within the Action Plan for Cooperation in the Field of Environment and Meteorology, an agreement signed by Turkey, the Islamic Republic of Iran, Iraq, the Syrian Arab Republic and Qatar in 2010, the Sand and Dust Storms Virtual Forecasting Center was established with TSMS, producing 72-hour dust transport forecasts for countries in the Middle East and North Africa. TSMS has developed the Meteorological Communications and Visualization Package, which is a software used in Azerbaijan, Yemen, Georgia and other territorial areas. TSMS also serves as the Eastern Mediterranean Climate Center, providing climate services for countries located in the eastern Mediterranean.

2. Assessment of adherence to the reporting guidelines

102. The ERT assessed the information reported in the NC7 of Turkey and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

G. Education, training and public awareness

1. Technical assessment of the reported information

103. In the NC7, Turkey 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; resource or information centres; the involvement of non-governmental organizations; and its participation in international activities.

104. CCAMCB under the Directorate General of Environmental Management formed the Education, Raising Awareness, and Capacity Building Working Group, which works with the Council of Higher Education and other stakeholders in the country to develop policies in the field of education, training and public awareness, ensuring that climate change studies

[8] As specified in the AR5.

are incorporated in the curricula of primary, secondary and higher education institutions in Turkey.

105. In recent years, non-State actors have played a greater role in climate change decision-making, and particularly in the preparation and domestic review of the NC7. During the review, Turkey provided a list of non-governmental organizations and other non-State actors that were invited to take part in the review.

106. Furthermore, additional information was provided during the review on national and international cooperation on education, training and public awareness on climate change. Turkey explained that several non-governmental organizations in Turkey are active in activities related to climate change, including the Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats; the Nature Conservation Centre; Greenpeace Mediterranean; and the World Wide Fund for Nature. Non-governmental organizations in Turkey work together to address mutual concerns about climate change through the Climate Network. Among other things, the Climate Network develops common climate change policies, which are proposed to the Government, and analyses and collectively forms opinions on national climate policies. Most non-governmental organizations in Turkey are self-funded; for example, the Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats raises funds for its activities through its volunteers' support and donations. The ERT noted that this information was not reported in the NC7.

107. The Ministry of Environment and Urbanization collaborates with other State and non-State actors to plan and implement climate change training and public awareness programmes in the country through the Climate Network. Other relevant instruments and initiatives deployed for effective climate change education, training and public awareness in Turkey include the Enhancing Joint Efforts on Climate Action Project, climate camps and the use of mass and social media to disseminate climate change related information in the country.

2. Assessment of adherence to the reporting guidelines

108. The ERT assessed the information reported in the NC7 of Turkey and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on NCs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

III. Conclusions and recommendations

109. The ERT conducted a technical review of the information reported in the NC7 of Turkey 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 Turkey.

110. As a Party included in Annex I to the Convention with no commitments inscribed in Annex B to the Kyoto Protocol, Turkey has no obligation to report on its national system in accordance with Article 5, paragraph 1, of the Kyoto Protocol; its national registry; supplementarity relating to the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol; or the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol. The information provided in the NC7 includes all of the elements of the supplementary information under Article 7 of the Kyoto Protocol that are applicable to Turkey.

111. Turkey's total GHG emissions excluding LULUCF were estimated to be 135.4 per cent above the 1990 level, while total GHG emissions including LULUCF were also estimated to be 135.4 per cent above the 1990 level, in 2016. Emission increases were driven by economic and population growth as well as rapid urbanization, which led to increased demand for housing, energy and transportation.

112. Turkey's main policy framework relating to energy and climate change is primarily set out in its cross-cutting strategies and plans, provided by the Tenth Development Plan, the National Climate Change Strategy (2010–2023), the National Climate Change Action Plan

(2011–2023), the Strategic Plan of the Ministry of Environment and Urbanization, the National Energy Efficiency Action Plan and the National Energy and Mining Policy. Key legislation supporting Turkey's climate change goals includes the Law on the Utilization of Renewable Energy Resources for the Purpose of Generating Electrical Energy, which serves as the basis for further laws and by-laws in the energy sector. These include the Energy Efficiency Law and by-laws on support of electricity manufacturing from renewable energy resources; energy performance in buildings; eco-design of energy-related products; indication by labelling and standard product information of the consumption of energy and other resources by energy-related products; and procedures and principles regarding the improvement of energy efficiency in transportation. Further key legislation in other sectors includes the Agricultural Law and the Law on Soil Conservation and Land Use, the Forest Law and by-laws on packaging waste control, waste management and landfills. Mitigation actions in the energy sector had the most significant impact on mitigation, particularly those aimed at increasing renewable energy and energy efficiency and adding nuclear power plants to the energy portfolio.

113. The GHG emission projections provided by Turkey include those under the WOM and WEM scenario. Under the two scenarios, GHG emissions including LULUCF are projected to be 229.6 and 270.1 per cent, respectively, above the 1990 level in 2020. In 2030, GHG emissions including LULUCF are projected to be 411.0 and 546.2 per cent, respectively, above the 1990 level. As Turkey did not provide sufficient information on the scenarios, it remains unclear whether the WEM scenario fully adheres to the UNFCCC reporting guidelines on NCs.

114. Owing to its special circumstances, Turkey does not have a target under the Kyoto Protocol or an emission reduction target under the Convention. However, in the context of its INDC in accordance with decisions 1/CP.19 and 1/CP.20, Turkey intends to reduce its GHG emissions by up to 21 per cent below the WOM scenario by 2030, which corresponds to a reduction of 246.70 Mt CO_2 eq.

115. Turkey has no commitments inscribed in Annex B to the Kyoto Protocol and, therefore, the use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol is not applicable to the Party.

116. In its NC7, Turkey reported information on its vulnerability to climate change impacts as well as on implemented and planned adaptation measures for key areas such as water resources, agriculture and food security (including fisheries and aquaculture), extreme weather events and disasters, ecosystems and biodiversity, coastal areas, human health, settlement areas and tourism. Information on integrated plans and projects for coastal zones, water resources and agricultural management was also provided. The most significant impact of climate change in Turkey will be on the water cycle, leading to a decrease in water resources. Model projections show that, as a result of the observed decrease in precipitation and significant temperature increase, Turkey's water potential will fall by 16 and 27 per cent by 2050 and 2075, respectively, making it extremely difficult to meet domestic, industrial and irrigation water needs.

117. Turkey provided information on its general policy and institutional framework as well as on its actions relating to research and systematic observation, and reported on its domestic and international activities. TSMS, as a member of the World Meteorological Organization and other related international organizations, actively participates in the World Climate Programme and the IPCC and cooperates with other countries via these organizations to promote free and open international exchange of data. The NC7 reflects Turkey's financial and capacity-building support for developing countries relating to climatic observation systems. All measurement and observation data from stations across the country are transmitted to TSMS for processing, archiving and distribution to domestic and global users. A number of national and international funding bodies support climate change research in Turkey, for example the Scientific Technological Research Council of Turkey and the EU. Efforts made include paleoclimatic studies, global and regional climate models, and research and development on mitigation and adaptation technologies.

118. In the NC7, Turkey provided information on its actions relating to education, training and public awareness at the domestic and international level. CCAMCB has a working group

responsible for developing policy, maintaining cooperation among State and non-State actors and coordinating contributions to the preparation of national reports submitted to the UNFCCC on matters related to education, training and public awareness. The Ministry of Environment and Urbanization collaborates with other State and non-State actors to plan and implement climate change training and public awareness programmes in the country through the National Climate Network.

119. In the course of the review, the ERT formulated the following recommendations for Turkey to improve its adherence to the UNFCCC reporting guidelines on NCs and its reporting of supplementary information under the Kyoto Protocol:[9]

(a) To improve the completeness of its reporting by:

(i) Including information on how PaMs are modifying longer-term trends in anthropogenic GHG emissions and removals in line with the objective of the Convention (see issue 7 in table 7);

(ii) Including 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, effects on international trade, and social, environmental and economic impacts on other Parties, especially developing country Parties and in particular those identified in Article 4, paragraphs 8 and 9, of the Convention, taking into account Article 3 (see issue 9 in table 7);

(iii) Reporting separately and without including in the totals, to the extent possible, emission projections related to fuel sold to ships and aircraft engaged in international transport (see issue 5 in table 11);

(iv) Reporting relevant information on factors and activities for each sector in order to provide the reader with an understanding of the emission trends in 1990–2020 and 1990–2030 (see issue 13 in table 11);

(v) Reporting the estimated and expected total effect of implemented and adopted PaMs (see issue 1 in table 13);

(vi) Estimating the total effect of PaMs in accordance with the WEM definition compared with a situation without such PaMs (see issue 3 in table 13);

(b) To improve the transparency of its reporting by:

(i) Providing more detailed information on how its national circumstances and changes therein affect GHG emissions and removals, specifically, on the effect of national circumstances on emissions from the agriculture, forestry and tourism sectors (see issue 1 in table 4);

(ii) Reporting a consistent set of PaMs in the textual and tabular parts of its NC (see issue 4 in table 7);

(iii) Providing a WEM projection with currently implemented and adopted PaMs, including the status of implementation of PaMs in the WEM scenario (see issue 2 in table 11);

(iv) Including an outline of the actions taken to implement Article 4, paragraph 1(b) and (e), with regard to adaptation in the vulnerability and adaptation chapter of the NC or provide clear references to the other sections of the report where this information may be reported (see issue 1 in table 15);

(c) To improve the timeliness of its reporting by submitting its next NC on time (see para. 7 above).

IV. Questions of implementation

120. No questions of implementation were raised by the ERT during the review.

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

Annex

Documents and information used during the review

A. Reference documents

2017 GHG inventory submission of Turkey. Available at https://unfccc.int/process/transparency-and-reporting/reporting-and-review-under-the-convention/greenhouse-gas-inventories/submissions-of-annual-greenhouse-gas-inventories-for-2017.

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

BR3 of Turkey. 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 Turkey. 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 Turkey. 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 Turkey submitted in 2016. FCCC/ARR/2016/TUR. 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 a joint first and second biennial report of Turkey. FCCC/TRR.2/TUR. Available at https://unfccc.int/documents/9476#beg.

Report on the technical review of the sixth national communication of Turkey. FCCC/IDR.6/TUR. Available at https://unfccc.int/documents/9495.

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.

"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.

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.

B. Additional information provided by the Party

Responses to questions during the review were received from Ms. Gamze Çelikyılmaz and Ms. Sezin Erbaş (Ministry of Environment and Urbanization of Turkey), including updated GHG emission projections.