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Report on the technical review of the third biennial report of Turkey

Developed country Parties were requested by decision 2/CP.17 to submit their third biennial report to the secretariat by 1 January 2018. This report presents the results of the technical review of the third biennial report 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".

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
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CTF	common tabular format
ERT	expert review team
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
HFC	hydrofluorocarbon
INDC	intended nationally determined contribution
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
NO	not occurring
N_2O	nitrous oxide
PaMs	policies and measures
PFC	perfluorocarbon
SF_6	sulfur hexafluoride
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 BR3[1] of Turkey. The review was organized 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 IV: UNFCCC guidelines for the technical review of biennial reports from Parties included in Annex I to the Convention" (annex to decision 13/CP.20).

2. In accordance with the same decision, 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 BR3 of Turkey in accordance with the UNFCCC reporting guidelines on BRs (annex I to decision 2/CP.17).

1. Timeliness

5. The BR3 was submitted on 1 January 2018, on the deadline of 1 January 2018 mandated by decision 2/CP.17. The CTF tables were submitted on 1 January 2018. Revised versions of the BR3 and CTF tables were submitted on 26 and 24 December 2018, respectively.

6. During the review, Turkey explained that the BR3 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. Turkey stated that it has already begun the arrangements for its application for GEF financing for the preparation and submission of its BR4.

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.

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 BR3 partially adheres to the UNFCCC reporting guidelines on BRs.

[1] The BR submission comprises the text of the report and the CTF tables, which are both subject to the technical review.

Table 1
Summary of completeness and transparency of mandatory information reported by Turkey in its third biennial report

Section of BR	*Completeness*	*Transparency*	*Reference to description of recommendations*
GHG emissions and trends	Complete	Transparent	
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target[a]	NA	NA	NA
Progress in achievement of targets[a]	Partially complete	Mostly transparent	Issues 2, 5 and 12 in table 6
Provision of support to developing country Parties[b]	NA	NA	NA

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] Turkey is a Party to the Convention with no target contained in document FCCC/SB/2011/INF.1/Rev.1 or any subsequent update thereto (FCCC/TP/2012/5 and FCCC/SBSTA/2014/INF.6). Therefore, in its BR3 and CTF tables, Turkey did not include information on the quantified economy-wide emission reduction target or related conditions and assumptions in CTF tables 2(a–f), or information on progress towards the achievement of the target in CTF tables 3, 4, 4(a)I, 4(a)II and 4(b). Turkey reported in its BR3 and CTF table 6(a) and (b) projections for 2020 and 2030 under the WEM and WOM scenario.

[b] 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.

II. Technical review of the information reported in the third biennial report

A. Information on greenhouse gas emissions and removals related to the quantified economy-wide emission reduction target

1. Technical assessment of the reported information

9. 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 2 illustrates the emission trends by sector and by gas for Turkey.

Table 2
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

[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.

	GHG emissions (kt CO_2 eq)					*Change (%)*		*Share (%)*	
	1990	*2000*	*2010*	*2015*	*2016*	*1990–2016*	*2015–2016*	*1990*	*2016*
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.

10. 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.

11. In brief, Turkey's national inventory arrangements were established in accordance with the Statistics Law of Turkey No. 5429, and there have been no changes to the arrangements since the BR2.

2. Assessment of adherence to the reporting guidelines

12. The ERT assessed the information reported in the BR3 of Turkey and recognized that the reporting is complete, transparent and adhering to the UNFCCC reporting guidelines on BRs. No issues relating to the topics discussed in this chapter of the review report were raised during the review.

B. Quantified economy-wide emission reduction target and related assumptions, conditions and methodologies

13. Turkey is a Party to the Convention with no target contained in document FCCC/SB/2011/INF.1/Rev.1 or any subsequent update thereto (FCCC/TP/2012/5 and FCCC/SBSTA/2014/INF.6). Therefore, the Party did not include information on the quantified economy-wide emission reduction target or related conditions and assumptions in its BR3 or CTF tables 2(a–f).

14. In the textual part of the BR3 on the quantified economy-wide emission reduction target, Turkey provided a description of its status under the Convention and its Kyoto Protocol as well as under the Doha Amendment to the Kyoto Protocol and explained that it does not have a quantified economy-wide emission reduction target. However, the ERT noted that, 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 (BR3, p.61).

C. Progress made towards the achievement of the quantified economy-wide emission reduction target

1. Mitigation actions and their effects

15. As mentioned in paragraph 13 above, Turkey does not have a target under the Convention. In the textual part of its BR3, on progress made in the achievement of the quantified economy-wide emission reduction target, Turkey has provided the same description of its status as mentioned in paragraph 14 above, and explained that CTF table 3 has been left blank because the Party does not have a quantified economy-wide emission reduction target. In CTF table 3, the Party has provided a footnote with the same explanation.

16. The BR3 and CTF table 3 do not include information on mitigation actions and their effects as required by the UNFCCC reporting guidelines on BRs. The ERT noted that the information on mitigation actions, including on the PaMs implemented or planned, are to be included in the BR only if the PaMs have been implemented or planned to achieve the economy-wide emission reduction target contained in document FCCC/SB/2011/INF.1/Rev.1 or any subsequent update thereto. As no target for the Party has been included in that document or any update thereto, the reporting of information in CTF table 3 is not applicable in the case of Turkey.

17. As Turkey does not have a quantified economy-wide emission reduction target under the Convention, it did not include information on response measures in its BR3.

2. Estimates of emission reductions and removals and the use of units from market-based mechanisms and land use, land-use change and forestry

18. The BR3 and CTF tables 4, 4(a)I, 4(a)II and 4(b) do not include any information on emission reductions and the use of units from market-based mechanisms under the Convention and other mechanisms, and the contribution of LULUCF to achieving Turkey's target as required by the UNFCCC reporting guidelines on BRs.

19. As mentioned in paragraph 13 above, Turkey does not have a quantified economy-wide emission reduction target under the Convention. The Party has provided a footnote explaining that CTF tables 4, 4(a)I, 4(a)II and 4(b) have been left blank for this reason.

20. The ERT noted that the reporting of information on emission reductions and the use of units from market-based mechanisms under the Convention and other mechanisms, and the contribution of LULUCF to achieving its target is relevant only for Parties with an economy-wide emission reduction target. The reporting of information in CTF tables 4, 4(a)I, 4(a)II and 4(b) is not applicable in Turkey's case as it has no such target.

3. Projections

(a) Projections overview, methodology and results

(i) Technical assessment of the reported information

21. 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").

22. The ERT noted that, according to information provided during the review, the WEM scenario as reported in the BR3 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 BRs.

23. In addition to the WEM scenario, Turkey reported a WOM scenario (defined in the BR3 as the "business as usual scenario"). During the review, Turkey confirmed that the WOM scenario excludes all PaMs implemented and in effect since 2012.

24. 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.

25. 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.

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

27. 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.

28. Turkey has made some improvements to its reporting since the BR2, 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. 29 below).

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

29. 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.

30. 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.[3] 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).

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

32. The methodology used for the preparation of the projections for the BR3 is identical to that used for the BR2 and has not been updated since then.

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

33. 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.

34. 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.

(iii) Results of projections

35. The projected emission levels under the WEM and WOM scenario are presented in table 3 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.

36. 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 BR3, the ERT was not able to conduct a comprehensive assessment on the projection trends reported by Turkey.

37. 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. 35 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 3
Summary of greenhouse gas emission projections for Turkey

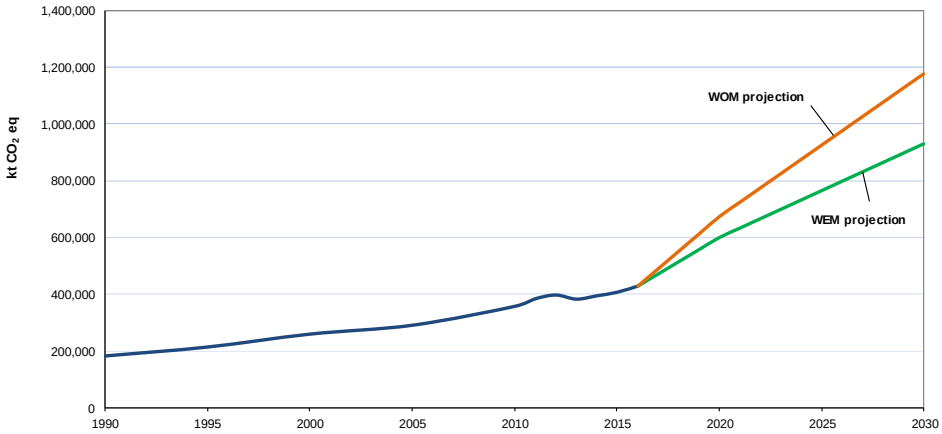
	GHG emissions (kt CO_2 eq per year)	*Changes in relation to base-year level (%)*	*Changes in relation to 1990 level (%)*
Quantified economy-wide emission reduction target under the Convention	NA	NA	NA
Inventory data 1990[b]	181 792.04	NA	0.0
Inventory data 2015[b]	406 261.50	NA	123.5
WOM projections 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
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.

38. 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).

39. Turkey presented the WEM scenario by sector for 2020 and 2030, as summarized in table 4.

Table 4
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.

40. 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.

41. Turkey presented the WEM scenario by gas for 2020 and 2030, as summarized in table 5.

Table 5
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

42. 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.

43. 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.

(iv) Assessment of adherence to the reporting guidelines

44. The ERT assessed the information reported in the BR3 of Turkey and identified issues relating to completeness, transparency and adherence to the UNFCCC reporting guidelines on BRs. The findings are described in table 6.

Table 6
Findings on greenhouse gas emission projections reported in the third biennial report of Turkey

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
1	Reporting requirement specified in paragraph 28 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not report a WAM scenario in its BR3. 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 BR. The ERT encourages Turkey to report a WAM scenario in its next BR.
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.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Issue type: transparency Assessment: recommendation	During the review, Turkey explained that the PaMs considered in the WEM projections were those reported in its INDC. The ERT noted that no information was provided on the status of implementation of PaMs in Turkey's INDC. 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 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not report a sensitivity analysis for its projections in the BR3. 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 BR. The ERT reiterates the encouragement made in the previous review report that Turkey report a sensitivity analysis for its projections in the next BR.
4	Reporting requirement specified in paragraph 35 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not report in its BR3 projections of indirect GHGs (carbon monoxide, nitrogen oxides, non-methane volatile organic compounds or sulfur oxides). 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 BR but did not elaborate on projections of indirect GHGs. The ERT encourages Turkey to report projections of indirect GHGs in its next BR.
5	Reporting requirement specified in paragraph 36 Issue type: completeness Assessment: recommendation	The ERT noted that Turkey did not report information on emission projections related to fuel sold to ships and aircraft engaged in international transport. 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. 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 Issue type: transparency Assessment: encouragement	The ERT noted from CTF tables 6(a) and (b) 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). 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. The ERT encourages Turkey to correct the emission projection reported for the IPPU sector for 2020 under the WEM scenario.
7	Reporting requirement specified in paragraph 42 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not provide sufficient information in the BR3 to enable a basic understanding of the models and approaches used to project emissions. The information in the BR3 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 it faced challenges in providing further information on the models and approaches used for projections. 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.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
8	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 it faced challenges in providing further information on the models and approaches used for projections. The ERT reiterates the encouragement made in the previous review report that Turkey include the above-listed information for each model or approach used.
9	Reporting requirement specified in paragraph 44 Issue type: completeness Assessment: encouragement	The ERT noted that Turkey did not provide in the BR3 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 BR.
10	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 it faced challenges in providing further information on the sensitivity of the projections to the underlying assumptions. The ERT reiterates the encouragement made in the previous review report that Turkey qualitatively and, where possible, quantitatively discuss in the BR3 the sensitivity of the projections to the underlying assumptions.
11	Reporting requirement specified in paragraph 47 Issue type: transparency Assessment: encouragement	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 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.
12	Reporting requirement specified in paragraph 48 Issue type: completeness Assessment: recommendation	The ERT noted that Turkey did not provide in its BR3 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.
13	Reporting requirement specified in paragraph 48 Issue type: completeness	The ERT noted that Turkey did not report in its BR3 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.

No.	*Reporting requirement, issue type and assessment*	*Description of the finding with recommendation or encouragement*
	Assessment: encouragement	The ERT encourages Turkey to report relevant information on factors and activities for each sector in tabular format in its next BR.

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.

(b) Assessment of the total effect of policies and measures

Technical assessment of the reported information

45. In the BR3 Turkey did not present the estimated and expected total effect of implemented and adopted PaMs in accordance with the WEM scenario. 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 BR3.

46. 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.

47. According to the information reported in the BR3, 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 WOM projections, 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 7 provides an overview of the effect of PaMs in the energy sector as reported by Turkey.

Table 7
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 BR3.

D. Provision of financial, technological and capacity-building support to developing country Parties

48. 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. The ERT notes the information on Turkey's status provided in its NC7 and referenced in the BR3.

III. Conclusions and recommendations

49. The ERT conducted a technical review of the information reported in the BR3 and CTF tables of Turkey in accordance with the UNFCCC reporting guidelines on BRs. Taking into account that it is a Party to the Convention with no target contained in document FCCC/SB/2011/INF.1/Rev.1 or any subsequent update thereto (FCCC/TP/2012/5 and FCCC/SBSTA/2014/INF.6), Turkey is not required to provide information on its quantified economy-wide emission reduction target and on the progress in the achievement of its quantified economy-wide emission reduction target in accordance with the UNFCCC reporting guidelines on BRs. The ERT concludes that the reported information partially adheres to the UNFCCC reporting guidelines on BRs.

50. Turkey's total GHG emissions excluding LULUCF were estimated to be 135.4 per cent above the 1990 level, and 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.

51. 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 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.

52. The GHG emission projections provided by Turkey in the BR3 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 provided insufficient information on the scenarios, it remains unclear whether the WEM scenario fully adheres to the UNFCCC reporting guidelines on NCs.

53. 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 compared with the WOM scenario by 2030, which corresponds to a reduction of 246.70 Mt CO_2 eq.

54. Turkey is not an Annex II Party and is therefore not obliged to adopt measures and fulfil obligations defined in Article 4, paragraph 3, 4 and 5, of the Convention.

55. In the course of the review, the ERT formulated the following recommendations for Turkey to improve its adherence to the UNFCCC reporting guidelines on BRs in its next BR:

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

(i) 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 6);

(ii) 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 12 in table 6);

(b) To improve the transparency of its reporting by providing a WEM projection with currently implemented and adopted PaMs (see issue 2 in table 6).

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.