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## **Report of the technical review of a joint first and second biennial report of Turkey**

According to decision 2/CP.17, developed country Parties are requested to submit their second biennial reports by 1 January 2016, that is, two years after the due date for submission of a full national communication. This report presents the results of the technical review of a joint first and second 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”.

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## **I. Introduction and summary**

### **A. Introduction**

1. This report covers the centralized technical review of the joint first and second biennial report (BR1/2)<sup>1</sup> 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). In accordance with the same decision, a draft version of this report was communicated to the Government of Turkey, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

2. The review took place from 6 to 11 June 2016 in Bonn, Germany, and was conducted by the following team of nominated experts from the UNFCCC roster of experts: Ms. Marta Alfaro (Chile), Mr. Daniel Bouille (Argentina), Mr. Amit Garg (India), Mr. Leonidas Osvaldo Girardin (Argentina), Ms. Kema Kasturiarachchi (Sri Lanka), Ms. Thelma Krug (Brazil), Mr. Asger Strange Olesen (Denmark), Mr. Nasimjon Rajabov (Tajikistan), Mr. Erik Rasmussen (Denmark), Ms. Sirinthornthep Towprayoon (Thailand), Mr. Goran Vukmir (Bosnia and Herzegovina) and Ms. Christina Davies Waldron (United States of America). Mr. Garg and Mr. Rasmussen were the lead reviewers. The review was coordinated by Ms. Xuehong Wang and Mr. Nalin Srivastava (UNFCCC secretariat).

### **B. Summary**

3. The expert review team (ERT) conducted a technical review of the information reported in the BR1/2 of Turkey in accordance with the “UNFCCC biennial reporting guidelines for developed country Parties” (hereinafter referred to as the UNFCCC reporting guidelines on BRs). During the review, Turkey provided the following additional relevant information: models and assumptions applied; and the scenario definitions for the greenhouse gas (GHG) emission projections.

#### **1. Timeliness**

4. The BR1/2 was submitted on 29 January 2016, after the deadlines of 1 January 2014 and 1 January 2016 for the first biennial report (BR1) and second biennial report (BR2), respectively, mandated by decision 2/CP.17. A revised version of the BR1/2 with editorial changes was submitted on 8 March 2016. The common tabular format (CTF) tables were submitted on 29 January 2016. Turkey did not inform the secretariat about its difficulties with the timely submission of its BR1 and BR2. During the review, Turkey explained that there was a delay in the initiation of the project entitled Support for the Preparation of Turkey’s First Biennial Report to the United Nations Framework Convention on Climate Change, which was executed by the Ministry of the Environment and Urbanization of Turkey, implemented by the United Nations Development Programme and funded by the Global Environment Facility (GEF). The project initiation was delayed until November 2014, almost 11 months after the deadline for the submission of the BR1. Therefore, Turkey could only prepare and submit its joint BR1/2 with delay. For future reports, Turkey has already prepared a project proposal for the GEF in order to ensure their timely submission. The ERT

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<sup>1</sup> The biennial report submission comprises the text of the report and the common tabular format (CTF) tables. Both the text and the CTF tables are subject to the technical review.

noted with great concern the delay in the submission of the BR1 and the related CTF tables. Further, the ERT noted with concern the delay in the submission of the BR1/2 and the related CTF tables.

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

5. Issues and gaps related to the reported information identified by the ERT are presented in table 1 below. The information reported by Turkey in its joint BR1/2 is partially in adherence with the UNFCCC reporting guidelines on BRs as per decision 2/CP.17.

Table 1

**Summary of completeness and transparency issues related to mandatory reported information in the joint first and second biennial report of Turkey**

<i>Chapter of the biennial report</i>	<i>Completeness</i>	<i>Transparency</i>	<i>Paragraphs with recommendations</i>
Greenhouse gas emissions and trends	Complete	Transparent	
Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target <sup>a</sup>	NA	NA	
Progress in achievement of targets <sup>a</sup>	NA/mostly complete <sup>b</sup>	NA/partially transparent <sup>b</sup>	21
Provision of support to developing country Parties <sup>c</sup>	NA	NA	

*Note:* A list of recommendations pertaining to the completeness and transparency issues identified in this table is included in chapter III.

*Abbreviation:* NA = not applicable.

<sup>a</sup> 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 joint first and second biennial report and common tabular format (CTF) tables, Turkey has not included information on the quantified economy-wide emission reduction target, or the related conditions and assumptions in CTF tables 2(a)–(f) and information on progress made in the achievement of the target in CTF tables 3, 4, 4(a)I, 4(a)II and 4(b).

<sup>b</sup> The assessment relates to the information on greenhouse gas emission projections provided by Turkey in its joint first and second biennial report and in CTF tables 5 and 6.

<sup>c</sup> Turkey is not a Party included in Annex II to the Convention and is therefore not obliged to adopt measures and fulfil obligations as defined in Article 4, paragraphs 3, 4 and 5, of the Convention.

**II. Technical review of the reported information**

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

6. Turkey has provided a summary of information on GHG emission trends for the period 1990–2013 in its BR1/2 and CTF tables 1(a)–(d). The joint BR1/2 makes reference to the national inventory arrangements, which are explained in more detail in the national inventory report included in Turkey’s 2015 annual inventory submission (in section 1.2). The national inventory arrangements were established in accordance with the reporting requirements related to national inventory arrangements contained in the “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” that are required by paragraph 3 of the UNFCCC reporting guidelines on BRs. Since the review relates to the joint submission of the BR1 and BR2, Turkey did not provide information on changes in the national inventory arrangements since its BR1.

7. The information reported in the BR1/2 on emission trends is consistent with that reported in the 2015 annual inventory submission of Turkey. To reflect the most recently available data, version 1.0 of Turkey's 2016 annual inventory submission has been used as the basis for discussion in chapter II.A of this review report.

8. Total GHG emissions<sup>2</sup> excluding emissions and removals from land use, land-use change and forestry (LULUCF) increased by 125.0 per cent between 1990 and 2014, whereas total GHG emissions including net emissions and removals from LULUCF increased by 129.6 per cent over the same period. The increase in the total GHG emissions can be attributed mainly to carbon dioxide (CO<sub>2</sub>) emissions, which increased by 160.5 per cent (excluding LULUCF<sup>3</sup>) between 1990 and 2014. Over the same period, emissions of methane (CH<sub>4</sub>) increased by 30.4 per cent, while emissions of nitrous oxide (N<sub>2</sub>O) increased by 41.0 per cent. The combined fluorinated gases, such as perfluorocarbons (PFCs), hydrofluorocarbons (HFCs) and sulphur hexafluoride (SF<sub>6</sub>), are reported for 2000 onwards, with the exception of PFCs, which are reported for the period 1990–2006. The overall level of HFCs and SF<sub>6</sub> emissions increased over the reported period. Emissions of nitrogen trifluoride (NF<sub>3</sub>) are not reported.

9. The ERT noted that, during the period 1990–2014, Turkey's gross domestic product (GDP) per capita increased by 78.6 per cent, while GHG emissions per GDP decreased by 9.5 per cent and GHG emissions per capita increased by 60.0 per cent. This development is the result of a combination of population and GDP growth, higher energy consumption and an increased number of cars on the roads. Table 2 below illustrates the emission trends by sector and some of the economic indicators relevant to GHG emissions for Turkey.

Table 2

**Greenhouse gas emissions by sector and some indicators relevant to greenhouse gas emissions for Turkey for the period 1990–2014**

Sector	GHG emissions (kt CO <sub>2</sub> eq)					Change (%)		Share by sector (%)	
	1990	2000	2010	2013	2014	1990–2014	2013–2014	1990	2014
	1. Energy	132 477.27	214 364.82	286 049.30	310 037.19	339 104.68	156.0	9.4	63.8
A1. Energy industries	33 937.30	68 191.61	102 608.67	113 903.62	132 248.49	289.7	16.1	16.3	28.3
A2. Manufacturing industries and construction	35 140.58	67 441.61	62 867.11	61 821.38	70 085.28	99.4	13.4	16.9	15.0
A3. Transport	27 003.68	36 507.96	45 468.26	68 997.11	73 700.01	172.9	6.8	13.0	15.8
A4.-A5. Other	33 072.02	37 516.44	68 411.05	58 326.17	54 351.43	64.3	–6.8	15.9	11.6
B. Fugitive emissions from fuels	3 323.56	4 707.08	6 694.07	6 988.78	8 719.35	162.3	24.8	1.6	1.9
C. CO <sub>2</sub> transport and storage	0.13	0.13	0.13	0.13	0.13	0.0	0.0	0.0	0.0
2. IPPU	23 124.39	28 410.05	51 784.73	63 212.57	62 809.54	171.6	–0.6	11.1	13.4
3. Agriculture	41 226.85	39 649.97	39 328.51	49 320.18	49 521.76	20.1	0.4	19.8	10.6

<sup>2</sup> In this report, the term “total GHG emissions” refers to the aggregated national GHG emissions expressed in terms of carbon dioxide equivalent excluding land use, land-use change and forestry, unless otherwise specified. Values in this paragraph are calculated based on the 2016 inventory submission, version 2.

<sup>3</sup> All values in this paragraph have been calculated based on the total GHG emissions excluding LULUCF.

Sector	GHG emissions (kt CO <sub>2</sub> eq)					Change (%)		Share by sector (%)	
	1990	2000	2010	2013	2014	1990–2014	2013–2014	1990	2014
	4. LULUCF	–30 229.20	–36 214.83	–47 193.46	–58 421.14	–59 880.26	98.1	2.5	NA
5. Waste	10 944.82	14 385.99	18 119.97	16 249.65	16 114.39	47.2	–0.8	5.3	3.4
6. Other	NO	NO	NO	NO	NO	NA	NA	NA	NA
<b>Total GHG emissions without LULUCF</b>	<b>207 773.32</b>	<b>296 810.84</b>	<b>395 282.51</b>	<b>438 819.58</b>	<b>467 550.38</b>	<b>125.0</b>	<b>6.5</b>	<b>100.0</b>	<b>100.0</b>
<b>Total GHG emissions with LULUCF</b>	<b>177 544.12</b>	<b>260 596.01</b>	<b>348 089.05</b>	<b>380 398.45</b>	<b>407 670.12</b>	<b>129.6</b>	<b>7.2</b>	<b>NA</b>	<b>NA</b>
<i>Indicators</i>									
GDP per capita (thousands 2011 USD using PPP)	10.67	13.01	16.63	18.56	18.87	76.8	1.7	–	–
GHG emissions without LULUCF per capita (t CO <sub>2</sub> eq)	3.85	4.69	5.47	5.85	6.16	60.0	5.3	–	–
GHG emissions without LULUCF per GDP unit (kg CO <sub>2</sub> eq per 2011 USD using PPP)	0.36	0.36	0.33	0.32	0.33	–9.5	3.5	–	–

Sources: (1) GHG emission data: Turkey's 2016 annual inventory submission, version 2; (2) GDP per capita data: World Bank.

Note: The ratios per capita and per GDP unit as well as the changes in emissions and the shares by sector are calculated relative to total GHG emissions without LULUCF using the exact (not rounded) values, and may therefore differ from the ratio calculated with the rounded numbers provided in the table.

Abbreviations: GDP = gross domestic product, GHG = greenhouse gas, IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry, NA = not applicable, NO = not occurring, PPP = purchasing power parity.

## B. Assumptions, conditions and methodologies related to the attainment of the quantified economy-wide emission reduction target

10. 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, Turkey has not included information on the quantified economy-wide emission reduction target or the related conditions and assumptions in its joint BR1/2 and CTF tables 2(a)–(f).

11. In the textual part of its joint BR1/2 on the quantified economy-wide emission reduction target, Turkey has 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 within the reporting period of the joint BR1/2 (2012–2015). The ERT noted that Turkey intends to reduce its GHG emissions up to 21 per cent below the 'business as usual' (BAU) scenario by 2030.

12. CTF tables 2(a)–(f) have been left blank, with a footnote in which Turkey explains that the tables are not applicable because, as a Party included in Annex I to the Convention with no commitments inscribed in Annex B to the Kyoto Protocol, Turkey does not have a quantified economy-wide emission reduction target within the reporting period (2012–2015) of the joint BR1/2. The ERT noted that the footnote refers to Annex B of the Kyoto Protocol,

although the target to be included in CTF tables 2(a)–(f), if any, is the target for 2020 under the Convention.

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

13. This chapter provides information on the review of the reporting by Turkey on the progress made in reducing emissions in relation to the target, mitigation actions taken to achieve its target, and the use of units from market-based mechanisms and LULUCF.

#### **1. Mitigation actions and their effects**

14. As mentioned in paragraph 10 above, Turkey does not have a target under the Convention. In the textual part of its joint BR1/2 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 11 above, and explained that CTF table 3 has been left blank because Turkey does not have a quantified economy-wide emission reduction target. In CTF table 3, the Party has provided the same footnote as mentioned in paragraph 12 above.

15. The joint BR1/2 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 policies and measures (PaMs) implemented or planned, shall only be included in the biennial report (BR) 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 Turkey 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.

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

16. As mentioned in paragraph 10 above, Turkey does not have a target under the Convention. In the textual part of its joint BR1/2 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 11 above, and explained that CTF tables 4, 4(a)I, 4(a)II and 4(b) 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 have been left blank because Turkey does not have a quantified economy-wide emission reduction target. In CTF tables 4, 4(a)I, 4(a)II and 4(b), the Party has provided the same footnote as mentioned in paragraph 12 above.

17. The joint BR1/2 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. 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 only relevant for Parties with an economy-wide emission reduction target specified in document FCCC/SB/2011/INF.1/Rev.1 or any update thereto. As no target for Turkey has been included in that document or any update thereto, the reporting of information in CTF tables 4, 4(a)I, 4(a)II and 4(b) is not applicable in the case of Turkey.

### 3. Projections

18. Turkey reported in its joint BR1/2 and CTF table 6(a) updated projections for 2020 and 2030 relative to actual inventory data for 1990, 1995, 2000, 2005, 2010 and 2012 under the ‘mitigation’ scenario, which, according to Turkey, can be compared to the ‘with existing measures’ (WEM) scenario (see para. 26 below). Projections are presented on a sectoral basis, for all sectors except for the transport sector, which has been included in the energy sector projections. Projections are provided on a gas-by-gas basis for the following GHGs: CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, PFCs, HFCs and SF<sub>6</sub>. 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 Intergovernmental Panel on Climate Change Fourth Assessment Report. Further information on the projections is provided in chapter V of the BR1/2.

19. The BR1/2 and CTF table 6(a) do not include the information required by the UNFCCC reporting guidelines on BRs on: emission projections related to fuel sold to ships and aircraft engaged in international transport; and factors and activities influencing emissions for each sector. In addition, the information reported by Turkey on the following elements is not transparent: the separate projections for the transport sector, which are now included under the energy sector projections; and information on the PaMs included under the mitigation scenario, which are not listed and it is therefore not possible for the ERT to confirm whether the scenario adheres to the WEM scenario definition (see para. 26 below).

20. During the review, Turkey provided additional information, elaborating on the above-mentioned completeness and transparency issues (see para. 19 above). Turkey explained that emissions from international transport had been included in the projections but were not reported separately, and confirmed that emissions from international transport will be reported separately in the next national communication (NC) and BR submissions. Turkey also confirmed that it will strive to provide separate transport sector projections in the next BR and NC submissions to improve the transparency of its reporting. With regard to the PaMs included under the mitigation scenario, Turkey explained that only PaMs with quantifiable effects that had been adopted, implemented and planned since 2012 were included under the scenario. Turkey confirmed the finding of the ERT that information on PaMs included under various scenarios should be provided, if possible also in tabular format, and that this could improve the transparency of its reporting.

21. The ERT recommends that Turkey improve the completeness of its reporting by separating the transport sector projections from those of the energy sector in its next submission, in order to ensure consistency with the reporting of PaMs, as required by the UNFCCC reporting guidelines on BRs. The ERT also recommends that Turkey enhance the transparency of its reporting by providing information in its next submission on projected emissions from international transport separately and on factors and activities driving emission trends in the individual sectors. In addition, the ERT recommends that Turkey provide clear definitions of its scenarios that adhere to the reporting requirements for the WEM scenario. This could include providing information in tabular and textual format that explains which PaMs are included under the scenario.

22. In addition to the mitigation scenario, Turkey reported in its joint BR1/2 and CTF tables 6(b) and 6(c) the BAU scenario, which, according to Turkey, can be compared to the ‘without measures’ (WOM) scenario. The projections are presented by sector and by gas in the same way as for the mitigation scenario for the years 2020 and 2030.

23. The joint BR1/2 and CTF tables 5, 6(b) and 6(c) do not include the information required by the UNFCCC reporting guidelines on BRs on: the sensitivity analysis and discussion of the results; sectoral and total projections for 2015; and emission projections for indirect GHGs such as carbon monoxide, nitrogen oxides and non-methane volatile organic compounds, as well as for sulphur oxides. The ERT noted that Turkey did not provide



information on the changes since the submission of its sixth national communication (NC6)/BR1 in the assumptions, methodologies, models and approaches used and on the key variables and assumptions used in the preparation of the projection scenarios, because the BR submission is a joint submission of both the BR1 and the BR2. In addition, information reported by Turkey on the following elements is not transparent: the type and characteristics of the models, because no references to sources of more detailed information on the models are provided.

24. During the review, Turkey provided additional information on the issues mentioned above (see para. 23 above). Turkey clarified that no sensitivity analysis had been conducted and that for future submissions such analysis could be undertaken and reported. It also confirmed its intention to include values for all relevant years for the projections, including 2015, in its future submissions. Turkey clarified that it will consider whether it is possible and feasible to include indirect GHGs in the projection studies for the next submission. With respect to the types of models used, Turkey provided information that allowed the ERT to identify the overall approach followed for all sectoral projections, and provided extensive material on the TIMES-MACRO model used for the energy (including transport) and industrial processes sectors. In addition, apart from the three assumptions provided in the joint BR1/2, Turkey provided projections for the use of various energy sources in 2020 and 2030 in the modelling approach, and noted that the underlying assumptions as such could be presented in tabular format in its next submission. However, Turkey also noted that some of these assumptions might remain confidential.

25. The ERT encourages Turkey to enhance the completeness of its reporting by providing the following information in its next submission: a sensitivity analysis and qualitative explanation of the results; projections for all sectors and the total projections for 2015; and the inclusion of indirect GHGs in all projections. To improve the transparency of its reporting, the ERT encourages Turkey to provide, in its next submission: brief information on the type and characteristics of all models applied in accordance with the UNFCCC reporting guidelines on BRs; references to sources that contain additional information on the models used for the projections; and an overview of all assumptions used, given the confidentiality considerations.

#### Overview of projection scenarios

26. The GHG emission projections provided by Turkey in its joint BR1/2 include those for mitigation (or WEM) and the BAU (or WOM) scenarios. The joint BR1/2 does not include information on the PaMs that were included under the mitigation scenario. Based on the information provided in the NC6, the ERT found that the mitigation scenario reported by Turkey includes some implemented and adopted PaMs and 38 planned PaMs up to 2020 and 2030. Turkey also reported a BAU scenario, starting from 2012 and up to 2020 and 2030. Turkey did not report on a 'with additional measures' scenario, nor did it provide a clear and consistent list of PaMs contributing to the BAU and mitigation scenarios in the joint BR1/2 (see paras. 19 and 21 above), apart from the explanation that its BAU scenario excludes all PaMs implemented or adopted after 2012. Based on the information provided, it appears that the scenarios have not been prepared in accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part II: UNFCCC reporting guidelines on national communications".

#### Methodology and changes since the previous submission

27. As the BR submission of Turkey is a joint submission covering the BR1 and BR2, it is not possible to review the changes in methodology since the previous NC submissions.

28. The methodologies applied to calculate the projections are reported in the textual part of the BR, apart from brief information on the use of a TIMES-based model for the energy

and industrial processes sectors. The information provided by Turkey during the review clarified that a TIMES-MACRO model was applied for the energy and industrial process sectors, and that linear regression and extrapolation combined with expert judgement were applied for the remaining sectors (see also para. 24 above).

29. To prepare its projections, Turkey relied on the following key variables for its underlying assumptions: GDP and population. These variables and assumptions are reported in CTF table 5. The assumptions have not been updated on the basis of the most recent economic developments known at the time of the reporting on projections, as the report was submitted five months in advance of the review. During the review, Turkey clarified that further assumptions had been used, but that these had not been included for reasons of confidentiality.

30. No sensitivity analyses were conducted for the key assumptions.

#### Results of projections

31. As Turkey does not have a quantified economy-wide emission reduction target, in this section the results of the projections are not compared to a target.

32. Turkey's reported projections of total GHG emissions excluding LULUCF for 2020 show an increasing emission trend compared with the 1990 level. Total emissions in 2020 are projected to be 226.9 per cent and 206.8 per cent above the 1990 level under the BAU and mitigation scenarios, respectively. This equates to an increase of 494,929.12 and 451,087.78 kt of carbon dioxide equivalent (CO<sub>2</sub> eq), respectively, above the 1990 level.

33. Similarly, Turkey's reported projections of total GHG emissions for 2030 show an increasing emission trend compared with the 1990 level. Total emissions in 2030 are projected to be 456.2 per cent and 357.8 per cent above the 1990 level under the BAU and mitigation scenarios, respectively. This equates to an increase of 995,313.73 and 780,532.57 kt CO<sub>2</sub> eq, respectively, above the 1990 level. Overall, emission projections for both scenarios follow steeper increasing trends than emission trends in the past.

34. On a gas-by-gas basis, Turkey reported that CO<sub>2</sub> emissions in 2012 (the starting year for projections) were 368,338.79 kt CO<sub>2</sub> eq. According to the projections, CO<sub>2</sub> emissions will increase to 564,093.32 kt CO<sub>2</sub> eq (or 53.1 per cent) and to 602,051.13 kt CO<sub>2</sub> eq (or 63.5 per cent) by 2020 under the mitigation and BAU scenarios, respectively. Under the mitigation scenario, compared with the 1990 level, projected non-CO<sub>2</sub> emissions show an increasing trend by 2020, with an expected increase in CH<sub>4</sub> emissions of 24,449.83 kt CO<sub>2</sub> eq (or 52.3 per cent) being the most significant. N<sub>2</sub>O emissions are projected to increase to 25,170.91 kt CO<sub>2</sub> eq, equivalent to an increase of 8,201.04 kt CO<sub>2</sub> eq (or 48.3 per cent). For 2030, the trend continues for all non-CO<sub>2</sub> emissions, with a further increase in CH<sub>4</sub> emissions by 20,610.25 kt CO<sub>2</sub> eq and an increase in N<sub>2</sub>O emissions by 5,933.71 kt CO<sub>2</sub> eq.

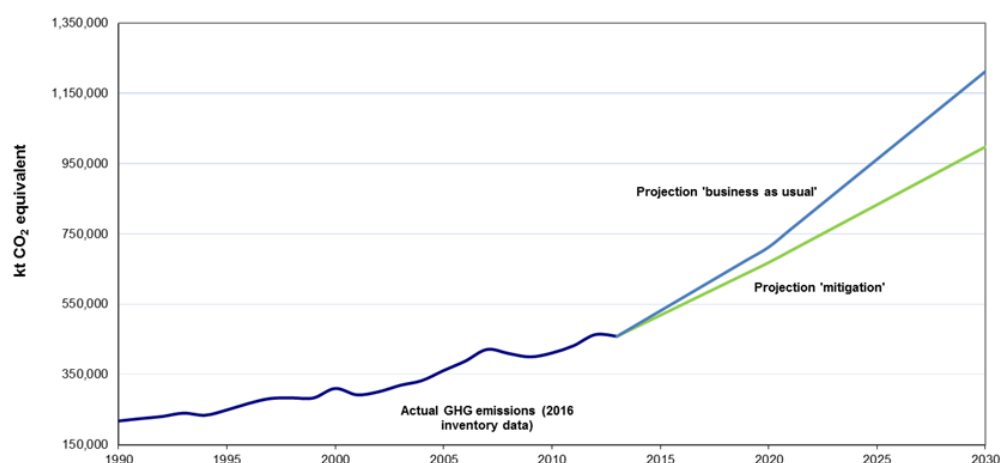
35. The joint BR1/2 of Turkey contains sectoral projections for the energy, industrial processes, agriculture, LULUCF and waste sectors, including transport under the energy sector. For the BAU scenario, all sectors reported, except for the LULUCF sector, show an increasing trend from 1990 to 2020. As the predominant driver of the overall emission trend towards 2020, emissions in the combined energy and transport sectors increased from 131,565.75 kt CO<sub>2</sub> eq in 1990 to 538,886.82 kt CO<sub>2</sub> eq in 2020, which is equivalent to an increase of 407,321.07 kt CO<sub>2</sub> eq (or 309.6 per cent). The industrial processes sector exhibits an increase of 63,672.06 kt CO<sub>2</sub> eq (or 204.9 per cent) during this period. For the LULUCF sector, an increase in net removals is observed, increasing from a removal of 30,175.60 kt CO<sub>2</sub> eq in 1990 to a removal of 40,193.25 kt CO<sub>2</sub> eq in 2020 (a 33.2 per cent increase in removals). The remaining sectors (agriculture and waste) show increases in emissions of less than 15,000.00 kt CO<sub>2</sub> eq (23.9 and 100.4 per cent, respectively) over the same period.

36. For the mitigation scenario, the dominant effect is observed in the projections for the combined energy and transport sectors. The expected increase in emissions amounts to 367,769.78 kt CO<sub>2</sub> eq (or 279.5 per cent) above the 1990 level in 2020, or 39,551.30 kt CO<sub>2</sub> eq less than projected under the BAU scenario. The LULUCF sector shows an increase in removals of 39,860.28 kt CO<sub>2</sub> eq above the 1990 level by 2020 (a 132.1 per cent increase in removals), which is 29,842.63 kt CO<sub>2</sub> eq more than under the BAU scenario. For the waste sector, an increase in emissions of 9,687.37 kt CO<sub>2</sub> eq (or 69.6 per cent) above the 1990 level is projected for 2020. The ERT notes that by both 2020 and 2030 no effect has been projected for the industrial processes and agriculture sectors under the mitigation scenario when compared with the BAU scenario.

37. For the period between 2020 and 2030 under the mitigation scenario, a continuous increase is observed for all sectors except for the LULUCF sector, with the energy and transport sectors showing an increase in emissions of 238,930.33 kt CO<sub>2</sub> eq, amounting to a total of 738,265.86 kt CO<sub>2</sub> eq in 2030. For the industrial processes sector, the increase in emissions between 2020 and 2030 amounts to 75,003.60 kt CO<sub>2</sub> eq, while for the LULUCF sector, net removals are projected to decrease to -69,710.38 kt CO<sub>2</sub> eq. For the agriculture sector, the increase amounts to 7,720.85 kt CO<sub>2</sub> eq, and for the waste sector the increase amounts to 7,790.00 kt CO<sub>2</sub> eq.

38. The projected emission levels under the different scenarios are presented in the figure below.

#### Greenhouse gas emission projections by Turkey



Sources: (1) Data for the years 1990–2014: Turkey’s 2016 annual inventory submission version 2 (not directly comparable to the projections, because Turkey’s 2014 GHG inventory submission was used as the basis for the projections); total GHG emissions excluding land use, land-use change and forestry; (2) Data for the years 2014–2030: Turkey’s joint first and second biennial report; total GHG emissions excluding land use, land-use change and forestry.

Abbreviation: GHG = greenhouse gas.

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

39. Turkey is not a Party included in Annex II to the Convention and is therefore not obliged to adopt measures and fulfil obligations as defined in Article 4, paragraphs 3, 4 and 5, of the Convention. This is also stated in Turkey’s joint BR1/2. The ERT notes the information on Turkey’s status provided in its BR.

### III. Conclusions

40. The ERT conducted a technical review of the information reported in the joint BR1/2 and CTF tables of Turkey in accordance with the UNFCCC reporting guidelines on BRs. Taking into account the fact that 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), the ERT concludes that the reported information is mostly complete and partially transparent, and therefore partially in adherence with the UNFCCC reporting guidelines on BRs and provides an overview on: GHG emissions and removals; and GHG projections.

41. For 2014, Turkey's total GHG emissions excluding LULUCF were estimated to be 125.0 per cent above the 1990 level, whereas total GHG emissions including LULUCF are 129.6 per cent above the 1990 level. The emission increase was driven by a combination of population and GDP growth and higher energy consumption; the latter is also related to the increase in transportation generated by the increase in the number of cars on the roads in Turkey.

42. As Turkey does not have a quantified economy-wide emission reduction target, no information was reported on the progress made in reducing emissions in relation to a target, including mitigation actions and the use of units from market-based mechanisms and LULUCF to achieve the target.

43. The GHG emission projections provided by Turkey in its joint BR1/2 include those for the BAU (or WOM) and mitigation (or WEM) scenarios. Under these two scenarios, emissions are projected to be 226.9 and 206.8 per cent above the 1990 level in 2020, respectively. This equates to an increase of 494,929.12 kt CO<sub>2</sub> eq and 451,087.78 kt CO<sub>2</sub> eq, respectively, above the 1990 level.

44. 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:<sup>4</sup>

- (a) Improve the completeness of its reporting by:
  - (i) Separating the transport sector projections from those of the energy sector (see para. 21 above);
- (b) Improve the transparency of its reporting by:
  - (i) Providing information and projections on international transport separately (see para. 21 above);
  - (ii) Providing information on factors and activities driving emission trends in the individual sectors (see para. 21 above);
  - (iii) Providing clear definitions of its scenarios that adhere to the reporting requirements for the WEM scenario (see para. 21 above);
- (c) Improve the timeliness of its reporting by submitting its next BR on time (see para. 4 above).

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<sup>4</sup> The recommendations are given in full in the relevant chapters of this report.

## Annex

### Documents and information used during the review

#### A. Reference documents

“UNFCCC biennial reporting guidelines for developed country Parties”. Annex to decision 2/CP.17. Available at <http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf#page=4>.

“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#page=2>.

“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 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>.

FCCC/ARR/2014/TUR. Report of the individual review of the inventory submission of Turkey submitted in 2014. Available at <http://unfccc.int/resource/docs/2015/arr/tur.pdf>.

FCCC/IDR.5/TUR. Report of the technical review of the fifth national communication of Turkey. Available at <http://unfccc.int/resource/docs/2015/idr/tur05.pdf>.

2015 greenhouse gas inventory submission of Turkey. Available at [http://unfccc.int/national\\_reports/annex\\_i\\_ghg\\_inventories/national\\_inventories\\_submissions/items/8812.php](http://unfccc.int/national_reports/annex_i_ghg_inventories/national_inventories_submissions/items/8812.php).

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Sixth national communication of Turkey. Available at [http://unfccc.int/files/national\\_reports/non-annex\\_i\\_natcom/application/pdf/6\\_bildirim\\_eng\\_11\\_reducedfilesize.pdf](http://unfccc.int/files/national_reports/non-annex_i_natcom/application/pdf/6_bildirim_eng_11_reducedfilesize.pdf).

Joint first and second biennial report of Turkey. Available at [http://unfccc.int/files/national\\_reports/biennial\\_reports\\_and\\_iar/submitted\\_biennial\\_reports/application/pdf/turkey\\_joint\\_first\\_and\\_second\\_biennial\\_report.pdf](http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/turkey_joint_first_and_second_biennial_report.pdf).

Common tabular format tables of the joint first and second biennial report of Turkey. Available at [http://unfccc.int/files/national\\_reports/biennial\\_reports\\_and\\_iar/submitted\\_biennial\\_reports/application/pdf/br2ctf\\_tur\\_2016\\_v1\\_0\\_formatted.pdf](http://unfccc.int/files/national_reports/biennial_reports_and_iar/submitted_biennial_reports/application/pdf/br2ctf_tur_2016_v1_0_formatted.pdf).

#### B. Additional information used during the review

Responses to questions during the review were received from Ms. Tugba Idikat Icmeli (Ministry of the Environment and Urbanization), including additional information on greenhouse gas projections.