



# TURKEY'S FOURTH BIENNIAL REPORT

.....  
DECEMBER 2019





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# Fourth Biennial Report of Turkey

Under the United Nations Framework Convention on Climate Change  
Republic of Turkey Ministry of Environment and Urbanization

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# List of Abbreviations and Symbols

AAU	Assigned Amount Unit
AFD	French Development Agency
BR	Biennial Report
AKTOB	Mediterranean Touristic Hoteliers and Investors Association
$C_{10}F_{18}$	Perfluorodecalin
$C_2F_6$	Hexafluoroethane
$C_3F_8$	Octafluoropropane
$C_4F_{10}$	Decafluorobutane
$C_4F_8$	Octafluorocyclobutane
$C_5F_{12}$	Dodecafluoropentane
$C_6F_{14}$	Perfluorohexane
c-C $3F_6$	Hexafluoropropylene
CBAMCC	Coordination Board on Air Management and Climate Change
CER	Certified Emission Reduction
$CF_4$	Carbon Tetrafluoride
$CH_4$	Methane
CMP	Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol
CO	Carbon Monoxide
$CO_2$	Carbon Dioxide
$CO_2$ -eq	Carbon Dioxide Equivalent
COP	Conference of the Parties
CRF	Common Reporting Format
EBRD	European Bank for Reconstruction and Development
EIB	European Investment Bank
ERU	Emission Reduction Unit
EU	European Union
GDNCNP	General Directorate of Nature Conservation and National Parks
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GWh	Gigawatt Hour
HFCs	Hydrofluorocarbons
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change



IUCN	International Union for Conservation of Nature
KfW	Reconstruction Credit Institute
kt	Kiloton
ICER	Long-term Certified Emission Reduction
LULUCF	Land Use, Land Use Change and Forestry
MAF	Ministry of Agriculture and Forestry
MENR	Ministry of Energy and Natural ResourcesW
MoEU	Ministry of Environment and Urbanisation
MoTI	Ministry of Transport and Infrastructure
MTMAC	Ministry of Transport, Maritime Affairs and Communications
N <sub>2</sub> O	Nitrous Oxide
NF <sub>3</sub>	Nitrogen Trifluoride
NIR	National Inventory Report
NMVOC	Non-Methane Volatile Organic Compounds
NOX	Nitrogen Oxide
ODA	Official Development Assistance
ODS	Ozone Depleting Substances
OECD	Organisation for Economic Cooperation and Development
OOF	Other Official Flows
PFCs	Perfluorocarbons
POPs	Persistent Organic Pollutants
SF <sub>6</sub>	Sulfur Hexafluoride
SMEs	Small and Medium Enterprises
tCER	Temporary Certified Emission Reduction
TOE	Tonne of Oil Equivalent
TUBITAK	Scientific and Technological Research Council of Turkey
TurkStat	Turkish Statistical Institute
TWh	Terawatt Hour
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNWTO	United Nations World Tourism Organisation
USD	The United States Dollar
WB	World Bank



# CHAPTER I **INTRODUCTION**

All countries are under the threat of climate change without exceptions. Being one of the countries in the Mediterranean where severe climate change impacts are projected according to IPCC Turkey is expected to face severe impacts due to climate change.

Turkey recognizes that climate change represents a pressing and complex problem that can lead to serious environmental and socioeconomic consequences and that it has become one of the most significant threats to the lives of future generations due to its long-term and cross sectoral effects. Efforts are necessary to limit emissions of greenhouse gases, the main cause of anthropogenic climate change, and to pursue multilateral international cooperation as nations seek to reduce impacts from and adapt to climate change.

When the United Nations Framework Convention on Climate Change (UNFCCC) was adopted in 1992, Turkey, as an Organization for Economic Cooperation and Development (OECD) member, was included among the Annex I and Annex II countries which bear most of the burden of the commitments made under the agreement. However, Turkey did not engage actively in Convention implementation until 2001, following negotiations which resulted in UNFCCC parties agreeing that Turkey's "special circumstances" should be recognized and that it could invoke the "common but differentiated responsibilities" principle under the Convention. As a result of decision 26/CP.7 of the UNFCCC adopted in 7th Conference of Parties (COP7) held in Marrakech in 2001, Turkey was removed from Annex II of the UNFCCC and State Parties were invited to recognize the special conditions which place Turkey in a different position from other Annex I countries. After this decision, Turkey became a party to UNFCCC on 24 May 2004. Then, it became an official party to the Kyoto Protocol on 26 August 2009. However, when Kyoto Protocol was adopted, Turkey was not in Annex-B as it was not a Party to the UNFCCC, thus it didn't have any quantified emission reduction or limitation targets. Nevertheless, Turkey undertakes significant activities toward decreasing emissions in the fields of energy efficiency, promotion of renewable energy, transportation and waste management. In addition, Turkey makes active efforts to participate in voluntary markets for emission credits through emission reduction projects.

Paris Agreement was opened for signature at the Center of United Nations located on New York City in USA between the 22 April 2016 and 21 April 2017. Turkey has signed Paris Agreement on April 22th, 2016. Turkey has signed the Paris Agreement but not ratify it yet.

Turkey submitted its INDC in October 2015 to secretary of UNFCCC. Turkey's INDC is "up to 21 percent reduction in GHG emissions from the Business as Usual (BAU) level by 2030. Implementation period of INDC is between the years 2020 and 2030"<sup>1</sup>

Today, almost all parties to the UNFCCC has signed the Paris Agreement. In order for Paris Agreement to enter into force, it had to be signed by at least 55 Parties to the Convention whose total emissions cover at least 55% of total global greenhouse gas emissions. On 5 October 2016, the threshold for entry into force of the Paris Agreement was achieved. The Paris Agreement entered into force on 4 November 2016.<sup>2</sup>With regards to reporting requirements, Turkey has submitted its First National Communication on Climate Change in 2007 and the Fifth National Communication on Climate Change where second, third, fourth and fifth communications were submitted together in 2013 to the UNFCCC. In 2016, Turkey submitted its Joint First and Second Biennial Report and Sixth National Communication. In 2018, Turkey submitted its Third Biennial Report and Seventh National Communication.

1 [https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/Turkey/1/The\\_INDC\\_of\\_TURKEY\\_v.15.19.30.pdf](https://www4.unfccc.int/sites/submissions/INDC/Published%20Documents/Turkey/1/The_INDC_of_TURKEY_v.15.19.30.pdf)  
2 <https://www.enerji.gov.tr/en-US/Pages/Climate-Change-And-International-Negotiations>



## CHAPTER II **NATIONAL CIRCUMSTANCES**

**T**urkey is located between 36° -42° north latitude and 26° - 45° east longitude in the Northern Hemisphere. Accordingly, there is a 76-minute local time difference between the west and east. Due to being located in the mid zone, four seasons are experienced distinctively during the year. Bulgaria and Greece in the west, Georgia, Armenia, Azerbaijan/Nakhichevan and Iran in the east and Iraq and Syria in the south constitute the neighbors of Turkey the lands of which are located between Europe and Asia. Turkey's land borders are 2,949 km long in total (SHW, 2014). The coastal border of the peninsula which is surrounded by three sides with the Black Sea in the north, the Aegean Sea in the west and Mediterranean in the south is 8,592 km in total except the islands.<sup>3</sup>

As referred in Seventh National Communication, the surface area of Turkey is 783562 km<sup>2</sup> and approximately 11.4% of this area is occupied by lakes and marshlands. 28.8% is forest land, 35.8% is cropland, 19% is grassland, 5% is settlements and other land.

Turkey is composed of seven geographic regions. These regions from small to the large based on their surface area are the Eastern Anatolia Region, Central Anatolia, Black Sea region, Mediterranean Region, Aegean Region, Marmara Region and Southeastern Anatolia Region.

Turkey is situated between the subtropical zone and temperate zone. Turkey is surrounded by sea on three sides, extension of the mountains and diverse nature of the landscape result in significant differences in climatic conditions from one region to the other. In the coastal regions of Turkey, milder climate is experienced due to the influence of the sea, and continental climate characteristics are seen in the inner parts of Turkey.<sup>4</sup>

Turkey's rich biodiversity is in part due to hosting a wide range of ecosystems including forests, mountains, steppe, wetlands, coastlines and seas, as well as its location at the intersection of the three bio-geographical regions: the European Siberian (Paleo-boreal European Forest); Mediterranean; and Iran-Turan. This impressive diversity of ecosystems and habitat is home to a significant diversity of species. For example, Turkey contains approximately 19000 invertebrate species, of which approximately 4,000 are endemic. Approximately 1,500 vertebrate species have been identified to date, including more than 100 endemic species. In terms of plant diversity, while there are only 12,500 gymnosperm and angiosperm plant species in the whole of the European continent, Turkey accommodates approximately 11,000 species. Approximately one-third of these are endemic to Turkey (IUCN, 2018). Climate change has the potential to pose a significant threat to the biological diversity of Turkey.

The surface area of Turkey is 783562 km<sup>2</sup> and approximately 11.4% of this area is occupied by lakes and marshlands. Turkey has a diversity of freshwater systems including a 1,263 km length of the Euphrates River and 523 km length of the Tigris River. There are many natural lakes and artificial lakes of various sizes. Turkey is a mountainous country with an average altitude of 1,141 meters.<sup>5</sup>

Turkey's consumable surface and ground water potential is 112 billion m<sup>3</sup> per year. Utilization rate of the current 112 billion m<sup>3</sup> of available freshwater resources is still around 48.2%. The amount of water available per capita per year in Turkey is about 1,403 m<sup>3</sup>. 40 billion m<sup>3</sup> of the available water is used for irrigation, 7 billion m<sup>3</sup> is used for drinking water and 7 billion m<sup>3</sup> is used in the industry. 39 billion m<sup>3</sup> (72.2%) of the consumed water is supplied from surface waters and 15 billion m<sup>3</sup> (27.8%) from groundwater.

The economic recession had directly caused reduction in the total GHG emissions in 1994, 1999, 2001 and 2008. In these years, total emissions are decreased 2.5%, 0.9%, 6.2% and 1.0% as compared to the previous year's emissions respectively. Although there is no economic recession, total emissions are slightly decreased by 1.8% in 2013. The fluctuations in the emission trends are mainly due to the trends in the GDP at market prices (constant 2010 USD) as shown in Figure 1 below;<sup>6</sup>

3 <https://webdosya.csb.gov.tr/db/destek/editorosya/SixthNationalCommunicationofTurkey.pdf>

4 [https://unfccc.int/sites/default/files/resource/14936285\\_Turkey-NC7-2-Sevenh%20National%20Communication%20of%20Turkey.pdf](https://unfccc.int/sites/default/files/resource/14936285_Turkey-NC7-2-Sevenh%20National%20Communication%20of%20Turkey.pdf)

5 [https://unfccc.int/sites/default/files/resource/Turkey%20nc5\\_turkey%5B1%5D.pdf](https://unfccc.int/sites/default/files/resource/Turkey%20nc5_turkey%5B1%5D.pdf)

6 <https://unfccc.int/documents/194819>

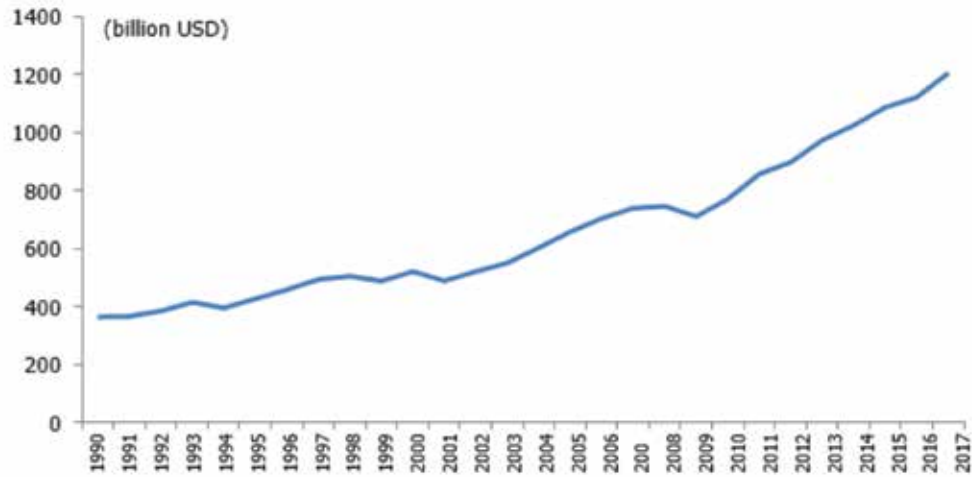


Figure 1. GDP 1990-2017 (NIR,2019)

GDP can be thought as the main driver of the GHG emissions in Turkey. It has nearly the same pattern as total GHG emissions for the period 1990-2017. While it was about 365 billion USD in 1990, it reached 1206 billion USD with 2010 constant prices in 2017. Although economic crisis in 1994, 1999, 2001, 2009 caused 4.7%, 3.4%, 6.0%, 4.7% decrease in GDP, Turkish economy grew about 230% for the period 1990-2017. Population data is another main driver of the emission trends in national inventories and the population trend of Turkey is given in Figure 2;

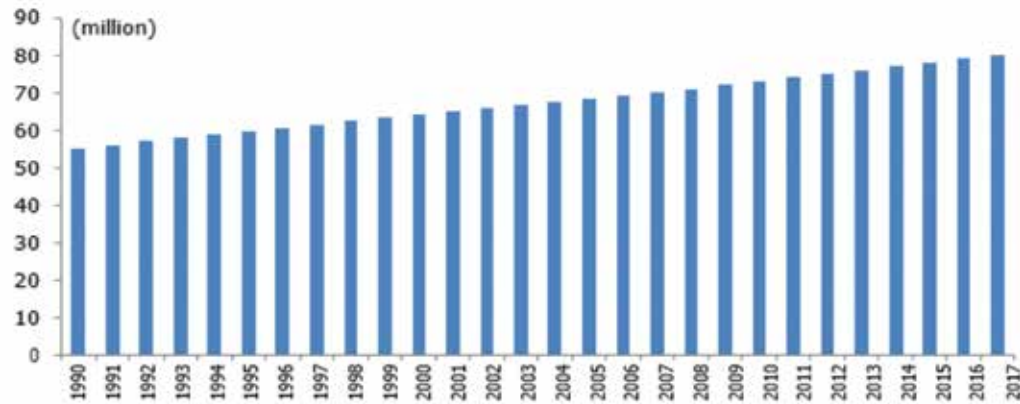


Figure 2. Mid-year Population 1990-2017 (NIR,2019)

The mid-year population of Turkey with increase about 45.7% for the period 1990-2017. While it was 55.1 million in 1990, it reached 80.3 million in 2017. The population is estimated to reach about 104.8 million in 2050. GHG emission per capita shows an increasing trend and it is parallel to the Turkey's total emissions trend.

7 <https://unfccc.int/documents/194819>





**Figure 3. Total GHG Emission per capita (NIR,2019)**

In Turkey, the installed capacity of electricity has increased by 6.6% on average between 2002 and 2018 and reached 88,551 MW. Between 2002 and 2018, electricity production has been on an upward trend due to general economic growth.

Turkey's annual per capita consumption of electricity increased by 83 percent between the years 2002-2016 showed about 1,932 kWh / capita level of 3,537 kWh / person is elevated to the level. In the same period, OECD consumption increased by only 1 percent and remained relatively stable at 8.050 kWh / person. However, despite this situation Turkey's per capita electricity consumption is far below the OECD average.



**Power installed of power plants, gross generation and net consumption of electricity 1990-2017**

Year	Total power installed (MW)	Gross generation (GWh)	Net consumption
1990	16.317,6	57.543,0	46.820,0
1991	17.209,1	60.246,3	49.282,9
1992	18.716,1	67.342,2	53.984,7
1993	20.337,6	73.807,5	59.237,0
1994	20.859,8	78.321,7	61.400,9
1995	20.954,3	86.247,4	67.393,9
1996	21.249,4	94.861,7	74.156,6
1997	21.891,9	103.295,8	81.885,0
1998	23.354,0	111.022,4	87.704,6
1999	26.119,3	116.439,9	91.201,9
2000	27.264,1	124.921,6	98.295,7
2001	28.332,4	122.724,7	97.070,0
2002	31.845,8	129.399,5	102.948,0
2003	35.587,0	140.580,5	111.766,0
2004	36.824,0	150.698,3	121.141,9
2005	38.843,5	161.956,2	130.262,9
2006	40.564,8	176.299,8	143.070,5
2007	40.835,7	191.558,1	155.135,2
2008	41.817,2	198.418,0	161.947,6
2009	44.761,2	194.812,9	156.894,1
2010	49.524,1	211.207,7	172.050,6
2011	52.911,1	229.395,1	186.099,6
2012	57.059,4	239.496,8	194.923,4
2013	64.007,5	240.154,0	198.045,2
2014	69.519,8	251.962,8	207.375,1
2015	73.146,7	261.783,3	217.312,3
2016	78.497,4	274.407,7	231.203,7
2017	85.200,0	297.277,5	249.022,6

Source: TETC Electricity Generation - Transmission Statistics of Turkey.

**Figure 4. Power installed of power plants, gross generation and net consumption of electricity <sup>8</sup>**

<sup>8</sup> [http://www.tuik.gov.tr/PreTablo.do?alt\\_id=1029](http://www.tuik.gov.tr/PreTablo.do?alt_id=1029)



The Electricity Generation and shares by energy resources is as below;

Year	Total	Coal	Liquid fuels	Natural Gas	Hydro	Renewable Energy and wastes <sup>(1)</sup>
	(GWh)	(%)				
1990	57.543	35,1	6,8	17,7	40,2	0,2
1991	60.246	35,8	5,6	20,8	37,6	0,2
1992	67.342	36,5	7,8	16,0	39,5	0,2
1993	73.808	32,1	7,0	14,6	46,1	0,2
1994	78.322	36,0	7,1	17,6	39,1	0,2
1995	86.247	32,5	6,7	19,2	41,2	0,4
1996	94.862	32,0	6,9	18,1	42,7	0,3
1997	103.296	32,8	6,9	21,4	38,5	0,4
1998	111.022	32,2	7,2	22,4	38,0	0,3
1999	116.440	31,8	6,9	31,2	29,8	0,3
2000	124.922	30,6	7,5	37,0	24,7	0,3
2001	122.725	31,3	8,4	40,4	19,6	0,3
2002	129.400	24,8	8,3	40,6	26,0	0,3
2003	140.581	22,9	6,6	45,2	25,1	0,2
2004	150.698	22,8	5,0	41,3	30,6	0,3
2005	161.956	26,6	3,4	45,3	24,4	0,3
2006	176.300	26,4	2,4	45,8	25,1	0,3
2007	191.558	27,9	3,4	49,6	18,7	0,4
2008	198.418	29,1	3,8	49,7	16,8	0,6
2009	194.813	28,6	2,5	49,3	18,5	1,2
2010	211.208	26,1	1,0	46,5	24,5	1,9
2011	229.395	28,8	0,4	45,4	22,8	2,6
2012	239.497	28,4	0,7	43,6	24,2	3,1
2013	240.154	26,6	0,7	43,8	24,7	4,2
2014	251.963	30,2	0,9	47,9	16,1	4,9
2015	261.783	29,1	0,9	37,9	25,6	6,5
2016	274.408	33,7	0,7	32,5	24,5	8,6
2017	297.278	32,8	0,4	37,2	19,6	10,0

Source: TETC, Electricity Generation - Transmission Statistics of Turkey

(1) Renewable energy and waste includes geothermal, solar, wind, solid biomass, biogas and waste.

**Figure 5. Electricity Generation and shares by energy resources**



The energy supplies defined as Coal, Lignite, Asphaltite, Coking Coal, Derivative Gases, Coal Tar, Crude Oil, Petroleum Products, Natural Gas, Bioenergy and Wastes, Hydraulic, Wind, Electric, Other Heat, Geothermal, Solar. The distribution of energy supplies is given in Annex II. (2017 National Energy Balance Table)

As referred National Inventory Report, total installed capacity reached to 85.200 MW with 8.5% increase from the previous year and more than 5.2 times higher than 1990 values. The total gross electricity consumption has increased by 6.2% in 2017 compared to the previous year. In the year 2017, gross consumption was 296.702 GWh meanwhile in 2016 this figure realized as 279.286 GWh.

In 2017, natural gas had high share of 37.17% in all electricity production, which was followed by hydro and geothermal (21.65%), other bituminous coal (19.1%), Turkish lignite (13,69%), other renewable (8%) and oil (0.4%). From 2016 to 2017, Electricity production from hydropower plants decreased by 14%. Amount of electricity production from Turkish lignite has increased from 38,57 TWh to 40,69 TWh, from 53,70 TWh to 56,78 TWh for other bituminous coal respectively. On the other hand, electricity production from natural gas increased from 89,23 TWh to 110,49 TWh.

In 2017 electricity production from fossil fueled thermal power plants has accounted for 212,14 TWh of a total of 297,278 TWh production whilst in 2016 electricity production from fossil fueled thermal power plants had accounted for 185,79 TWh of a total of 274,408 TWh production. Fossil fueled thermal share in electricity production increased from 67.7% in 2016 to 71.3% in 2017.

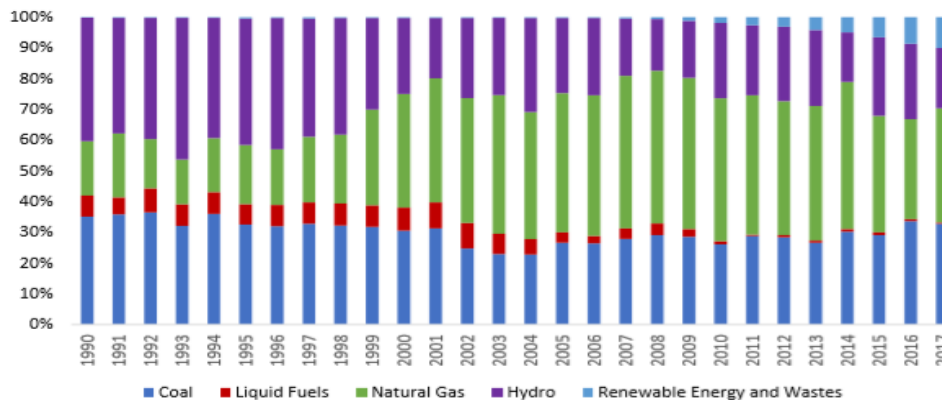


Figure 6. Energy Mix of Public electricity and heat production

There was an accelerated increase in wind installed capacity from 5.751 MW in 2016 to 6.516 MW in the year 2017. Renewable Law which came into force in 2005 later revised in 2011 provided some supporting mechanism for purchasing electricity from solar, biomass, geothermal, wind and hydraulic energy. In the year 2017 solar power plants installed capacity raised to 3.421 MW. The role of voluntary carbon market is important to mention, as many of the wind projects in the country generate and sell the voluntary carbon credits.

Electricity generation from animal and yard waste has increased by 25.3% compared to the previous year, reaching to 642 MW of installed power, generating 2.972 GWh of power in 2017.

In 2017, Turkey's Total Primary Energy Supply (TPES) was 6 083 612.83 TJ, a 6.7% increase compared to 2016. Oil had a share of 1 855 861.49 TJ while hard coal and gas accounted for 1 034 414.53 TJ and 1 855 561,49 TJ respectively<sup>9</sup>

<sup>9</sup> <https://unfccc.int/documents/194819>

In Turkey, forests are managed according to the sustainable forest management principles, and the country is one of the few countries in the world that have increased their forest areas. The forest area increased from 20.20 million ha in 1973, to 22.3 million ha in 2018. Restoration and reforestation activities have been conducted since 1995.

Forest form	Total		Productive		Degraded	
	Hectare	%	Hectare	%	Hectare	%
1973	20.199.296	100	8.856.457	44	11.342.839	56
High forest	10.934.607	54	6.176.899	31	4.757.708	23
Coppice forest	9.264.689	46	2.679.558	13	6.585.131	33
1999	20.763.248	100	10.027.568	49	10.735.680	51
High forest	14.418.340	69	8.237.753	40	6.180.587	29
Coppice forest	6.344.908	31	1.789.815	9	4.555.093	22
2005	21.188.747	100	10.621.221	50	10.567.526	50
High forest	15.439.595	73	8.940.215	42	6.499.380	31
Coppice forest	5.749.152	27	1.681.006	8	4.068.146	19
2009	21.389.783	100	10.972.509	51	10.417.274	49
High forest	16.305.210	76	9.494.322	44	6.810.888	32
Coppice forest	5.084.573	24	1.478.187	7	3.606.386	17
2010	21.537.091	100	11.202.837	52	10.334.254	48
High forest	16.662.379	77	9.782.513	45	6.879.866	32
Coppice forest	4.874.712	23	1.420.324	7	3.454.388	16
2012	21.678.134	100	11.558.668	53	10.119.466	47
High forest	17.260.592	79	10.281.728	47	6.978.864	32
Coppice forest	4.417.542	21	1.276.940	6	3.140.602	15
2015	22.342.935	100	12.704.148	57	9.638.787	43
High forest	19.619.718	88	11.919.061	54	7.700.657	34
Coppice forest	2.723.217	12	785.087	3	1.938.130	9
2018	22.621.935	100	12.983.148	57	9.638.787	43
High forest	21.421.769	95	12.633.298	56	8.788.471	39
Coppice forest	1.200.166	5	349.850	1	850.316	4

**Figure 7. Distribution of forest land, 1973, 1999, 2005, 2009, 2010, 2012, 2015, 2018** <sup>10</sup>

<sup>10</sup> <https://www.ogm.gov.tr/ekutuphane/istatistikler/Forms/AllItems.aspx?RootFolder=%2Fekutuphane%2Fistatistikler%2FOrmanc%C4%B1%C4%B1k%20>



## CHAPTER III INFORMATION ON GREENHOUSE GAS EMISSIONS AND TRENDS

### III.I. Summary Information on National Inventory Arrangements

As referred in National Inventory Report 2019, The Turkish national inventory system is featured by centralized governance. Ministry of Environment and Urbanization (MoEU) is the National Focal Point of the UNFCCC and is responsible for climate change and air pollution policies and measures. Turkey established the Coordination Board on Climate Change (CBCC) in 2001 with the Prime Ministerial Circular no.2001/2 in order to determine the policies, measures and activities to be pursued by Turkey on climate change. Under the chairmanship of Minister of Environment and Urbanization, this board is composed of high level representatives (Deputy Ministers and General Directors) from Ministries related to foreign relations, finance, economy, energy, transport, industry, agriculture, forestry, health, education, TurkStat, and Non-Governmental Organisations (NGOs) from business sector. The CBCC was restructured in 2013 and renamed as Coordination Board on Climate Change and Air Management (CBCCAM). The CBCCAM, a public body created by Prime Minister Circular 2013/11, is competent for taking decisions and measures related to climate change and air management.

Coordination Board on Climate Change and Air Management Decisions is the first legal means for national inventory system. Under the Coordination Board currently there are seven working groups (WGs):

Working Groups of Coordination Board on Climate Change and Air Management						
GHG Mitigation WG	Climate Change Adverse Effects and Adaptation WG	GHG Emission Inventory WG	Finance WG	Technology Development and Transfer WG	Education, Capacity Building WG	Air Management WG

**Figure 8. Working Groups of Coordination Board on Climate Change and Air Management**

The national GHG inventory is prepared under the auspices of the “GHG Emission Inventory Working Group” which was established in 2001 by the former CBCC. TurkStat was formally appointed as single national responsible authority to coordinate and implement national inventory activities from planning to management by Decision 2009/1 of the CBCC in 2009. TurkStat is also in charge of annual inventory submission to the UNFCCC Secretariat and of responding to the ERT recommendations.

The GHG national inventory is compiled by GHG Emission Inventory working group under the coordination of TurkStat. The institutions included in the working group are Turkish Statistical Institute (TurkStat), Ministry of Energy and Natural Resources (MENR), Ministry of Transport and Infrastructure (MoTI), Ministry of Environment and Urbanization (MoEU), Ministry of Agriculture and Forestry (MAF).

The national inventory arrangements are designed and operated to ensure the TACCC quality objectives and timeliness of the national GHG inventories. The quality requirements are fulfilled by implementing consistently inventory quality management procedures. Responsibilities of the institutions involved in the national GHG inventory are shown in Figure 9<sup>11</sup>;

<sup>11</sup> <https://unfccc.int/documents/194819>



**Figure 9: Institutions by responsibilities for national GHG inventory**

Sector	CRF category	Collection of Activity Data	Selection of Methods and Emission Factors	GHG Emission Calculation	Filling in CRF tables and preparing NIR	Quality control
Energy	1 –Energy (Excluding 1.A.1.a – Public electricity and heat production, and 1.A.3 – Transport)	MENR TurkStat	TurkStat	TurkStat	TurkStat	TurkStat
	1.A.1.a – Public electricity and heat production	MENR	MENR	MENR	MENR	MENR
	1.A.3 – Transport	MoTI TurkStat	MoTI	MoTI	MoTI	MoTI
Industrial Processes and Other Product Uses	2 – IPPU (except Fgases)	TurkStat	TurkStat	TurkStat	TurkStat	TurkStat
	F-gases	MoEU	MoEU	MoEU	MoEU	MoEU
Agriculture	3 – Agriculture	TurkStat	TurkStat	TurkStat	TurkStat	TurkStat
Land use, land-use change and forestry	4 – LULUCF	MAF	MAF	MAF	MAF	MAF
Waste		TurkStat	TurkStat	TurkStat	TurkStat	TurkStat
Cross cutting issues						
Key category analysis	TurkStat					
Uncertainty analysis	TurkStat					



## III.II. Trends in Greenhouse Gas Emissions

Turkey's total GHG emissions, excluding the LULUCF sector, were estimated to be 526.3 Mt of CO<sub>2</sub> equivalent (CO<sub>2</sub> eq.) in 2017. This represents an increase of 27.8 Mt, or 5.6%, in emissions compared to 2016, and an increase of 140.1% above 1990 levels. (NIR 2019)

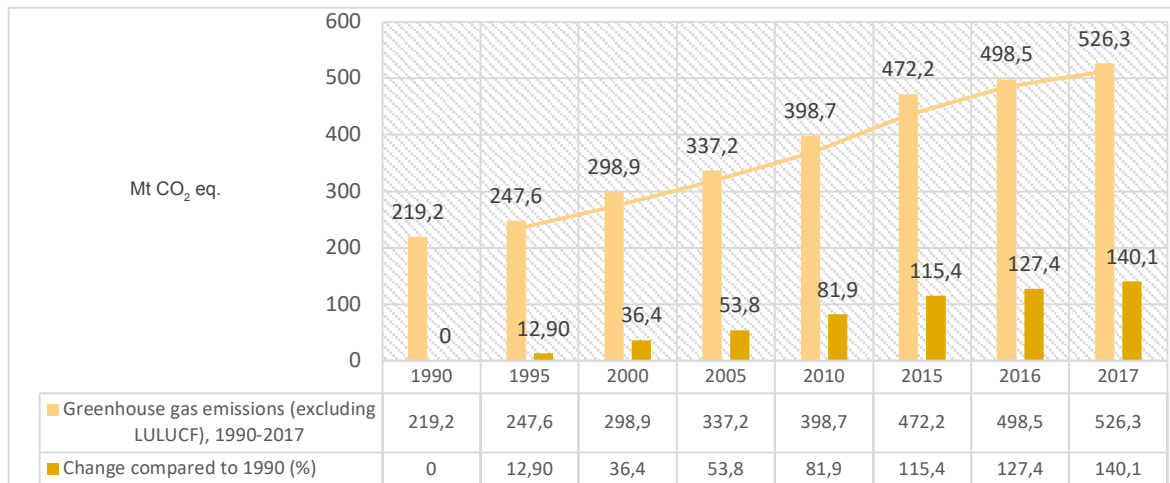


Figure 10. Greenhouse gas emissions (excluding LULUCF), 1990-2017

Turkey's total GHG emissions, including the LULUCF sector, were 426.3 Mt CO<sub>2</sub> eq. in 2017. Thus, LULUCF included total emissions increased 5.9% as compared to 2016 emissions. There is a 160.9% increase from 1990 to 2017.

Total GHG emissions as CO<sub>2</sub> eq. for the year 2017 were 526.3 Mt (excluding LULUCF). In overall 2017 emissions, the energy sector had the largest portion with 72.2%. The energy sector was followed by the sectors of IPPU with 12.6%, the agriculture with 11.9% and the waste with 3.3%. GHG emissions by sectors are given in Figure 11.<sup>12</sup>



Figure 11. Greenhouse Gas Emission by Sectors

<sup>12</sup> <https://unfccc.int/documents/194819>



As shown in Figure 12, emissions from energy increased by 5.6% to 379.9 Mt CO<sub>2</sub> eq. in 2017 as compared to 2016. However, there is 172% increase as compared to 1990. Emissions in the IPPU sector increased to 66.5 Mt CO<sub>2</sub> eq. in 2017 which is 6.9% higher than the emissions in 2016. Emissions in the agriculture and waste sectors were 62.5 and 17.4 Mt CO<sub>2</sub> eq. respectively in 2017<sup>13</sup>

Total (Mt CO <sub>2</sub> eq.)							
Year	Energy	IPPU	Agriculture	LULUCF	Waste	Excluding LULUCF	Including LULUCF
1990	139,6	22,8	45,7	-55,8	11,1	219,2	163,4
1991	144,0	24,7	46,5	-56,7	11,3	226,6	169,9
1992	150,3	24,3	46,6	-56,9	11,5	232,8	175,9
1993	156,8	24,5	47,0	-56,1	11,8	240,1	184,1
1994	153,3	24,2	44,6	-57,5	12,0	234,1	176,7
1995	166,3	25,2	43,7	-57,4	12,4	247,6	190,2
1996	184,0	26,2	44,4	-57,7	12,7	267,2	209,5
1997	196,2	27,0	42,2	-61,7	13,2	278,6	216,9
1998	195,9	27,4	43,6	-62,6	13,5	280,3	217,7
1999	193,8	25,8	44,2	-64,0	13,9	277,8	213,7
2000	216,1	26,2	42,3	-61,6	14,3	298,9	237,3
2001	199,2	25,9	39,8	-64,7	15,5	280,4	215,7
2002	205,8	26,9	37,4	-72,5	15,9	286,1	213,6
2003	220,3	28,2	40,9	-74,5	16,2	305,6	231,0
2004	226,1	30,8	41,4	-73,7	16,6	315,0	241,3
2005	244,0	33,6	42,3	-74,7	17,3	337,2	262,5
2006	260,0	36,7	43,5	-74,7	18,0	358,2	283,4
2007	290,8	39,2	43,2	-74,4	18,3	391,4	317,0
2008	287,3	40,9	41,0	-69,2	18,3	387,6	318,4
2009	292,5	42,5	41,7	-72,8	18,8	395,5	322,7
2010	287,0	48,1	44,0	-73,5	19,5	398,7	325,2
2011	308,7	52,7	46,4	-77,1	19,8	427,6	350,5
2012	320,5	55,0	52,1	-74,4	19,4	446,9	372,5
2013	307,5	58,1	55,2	-76,5	18,2	439,0	362,5
2014	325,8	58,5	55,5	-77,5	18,2	458,0	380,5
2015	340,9	57,0	55,4	-97,2	18,8	472,2	375,0
2016	359,7	62,2	58,2	-95,9	18,4	498,5	402,5
2017	379,9	66,5	62,5	-99,9	17,4	526,3	426,3

Figure 12. Greenhouse gas emissions by sectors, 1990-2017 (Table version)

13 <https://unfccc.int/documents/194819>



### III.II.I. Energy

As referred in National Inventory Report 2019, the energy sector includes emissions from the combustion of fossil fuels (energy industries manufacturing industries and construction; transport; and other sectors; as well as fugitive emissions from fossil fuels and CO<sub>2</sub> transportation and storage. Energy sector is the major source of Turkish anthropogenic GHG emissions. In overall 2017 GHG emissions (excluding LULUCF), the energy sector had the largest portion with 72.2%. Energy sector CO<sub>2</sub> emissions constituted 86.3% of total CO<sub>2</sub> emissions in 2017. The non-CO<sub>2</sub> emissions from energy-related activities represented rather small portion of the total national emissions. CH<sub>4</sub> emissions are 16.4% of total national CH<sub>4</sub> emissions and N<sub>2</sub>O emissions are 10.7% of total N<sub>2</sub>O emissions in 2017.

Energy sector GHG emissions increased by 172% between 1990 and 2017 whereas annual emissions from 2016 to 2017 increased by 5.6% (20.2 Mt CO<sub>2</sub> eq.).

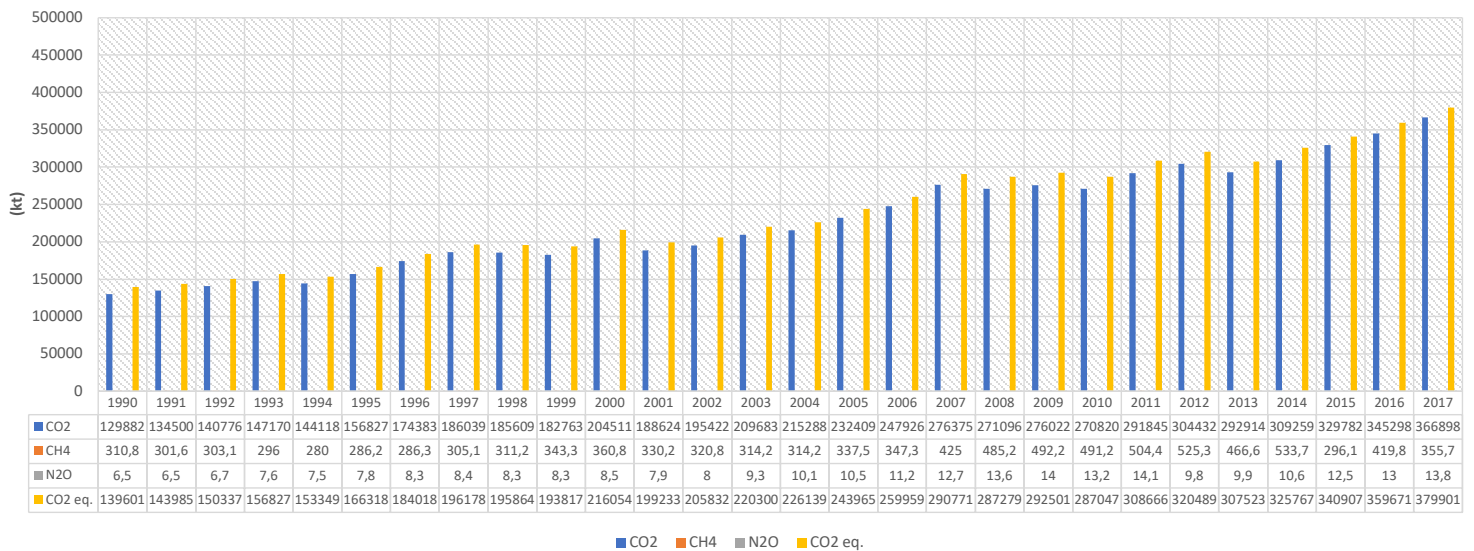
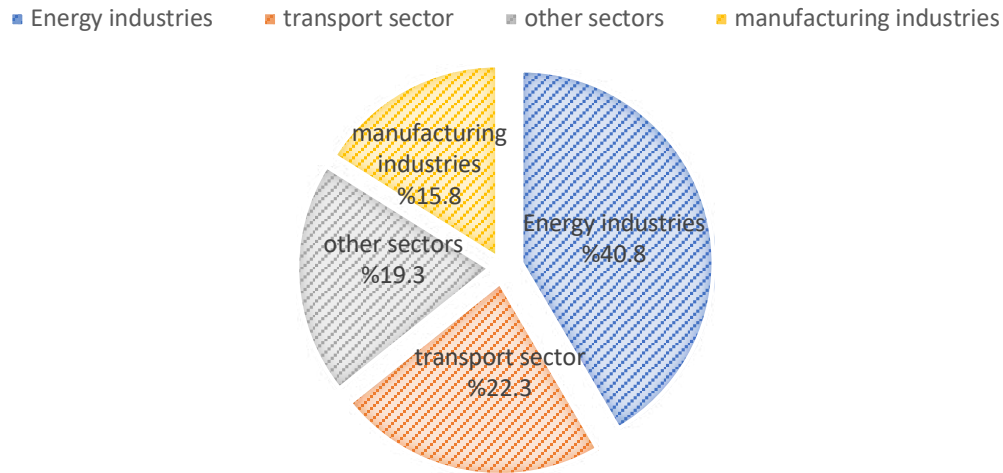


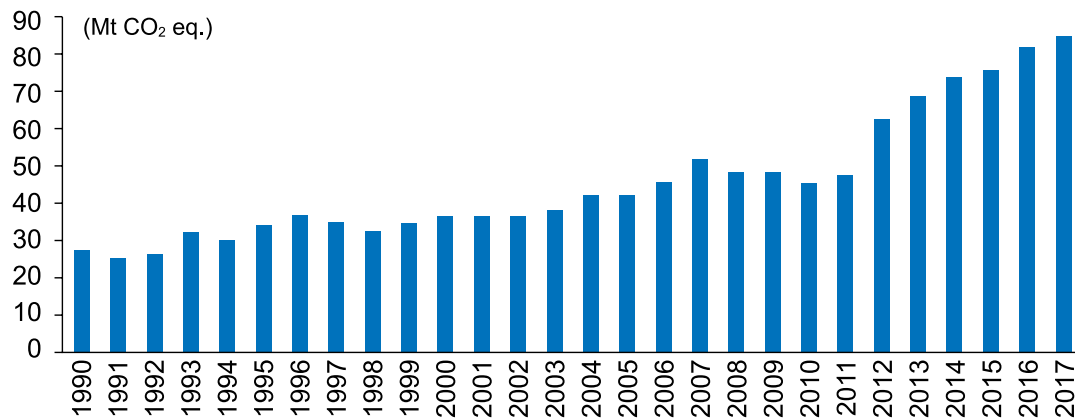
Figure 13. Energy Sector Emissions by gas 1990-2017

Total emissions from the energy sector for 2017 were estimated to be 380 Mt CO<sub>2</sub> eq. Energy industries were the main contributor, accounting for 40.8% of emissions from the energy sector. It is followed by transport sector with 22.3%, other sector with 19.3% and manufacturing industries with 15.8%. (NIR,2019)



**Figure 14. Total Emissions from the energy sector for 2017**

In 2017, transport contributed 84.7 Mt CO<sub>2</sub> eq., which is 16.1% of total GHG emissions (excluding LULUCF). The major source of transport emissions in Turkey is road transportation. It accounts for 93.0% of transport emissions. It is followed by domestic aviation while other sources are far smaller: domestic aviation with 4.5% and domestic navigation with 1.1%. Pipeline transport contribution was 0.9% and railway contribution was 0.5%. (NIR,2019)



**Figure 15. GHG emissions for transportation sector, 1990-2017<sup>14</sup>**

Emissions from transport sector increased 214% (57.7 Mt CO<sub>2</sub> eq.) in 2017 compared to 1990. In the same period increase in road transportation emissions was 218%, in domestic aviation it was 316% and in domestic navigation it was 86%. Emissions from railway transport decreased by 43% between 1990 and 2017.

<sup>14</sup> <https://unfccc.int/documents/194819>

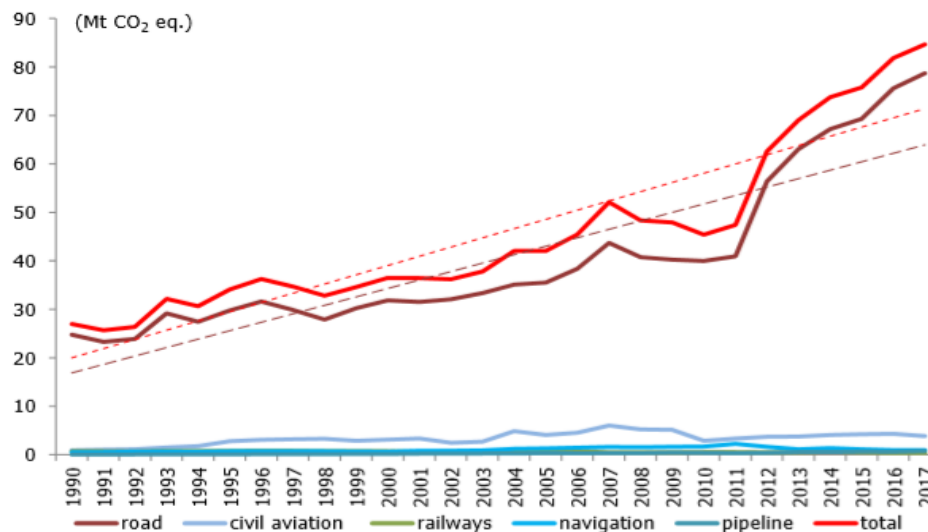


Figure 16. GHG emission trend by transport mode, 1990-2017<sup>15</sup>

Emissions from this category were 213.9% higher in 2017 than in 1990, and on average emissions increased by more than 7.6% annually.

### III.II.II. Industrial Processes and Product Use

As referred in National Inventory Report 2019, the GHG emissions from industrial processes and product use are released as a result of manufacturing processes. It means this category includes only emissions from processes and not from fuel combustion used to supply energy for carrying out the processes. For that reason, emissions from industrial processes are referred to as non-combustion.

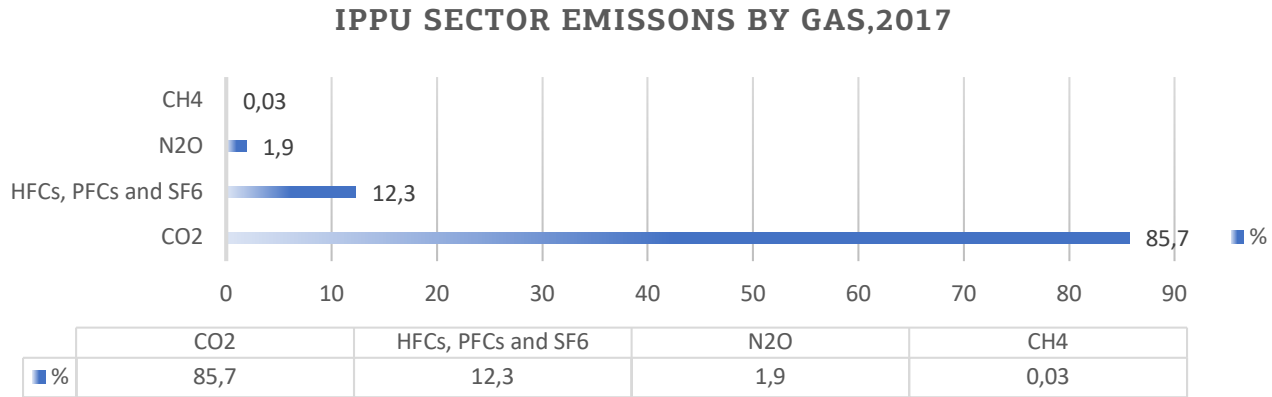
Industrial processes whose contribution to CO<sub>2</sub> emissions were identified as key category are production of cement, lime, and iron and steel, as well as other process uses of carbonates in different industrial activities. PFC emissions from aluminum production and HFCs from product uses as ODS substitutes are also considered key categories.

GHG emissions from industrial processes and product use contributed 15.6% to the total anthropogenic GHG emissions in Turkey in 2017, in total 66 454 kt CO<sub>2</sub> eq.

The most important GHG emission sources of IPPU in 2017 were CO<sub>2</sub> emissions from cement production and iron and steel production, with 7.1% and 2.2% shares of the total national GHG emissions, respectively. The mineral industry contributed 66.6% of the sector's emissions, the metal industry contributed 17.9%, product uses as ODS substitutes contributed 12.1%, while the chemical industry contributed 3%.

The main gas emitted by the IPPU sector in 2017 was CO<sub>2</sub>, contributing 85.7% (56 980 kt) of the sector emissions in 2017. HFCs, PFCs and SF<sub>6</sub> contributed 12.3% (8 195kt CO<sub>2</sub> eq.) while the share of N<sub>2</sub>O emissions was 1.9% (1 263 kt CO<sub>2</sub>eq.) and CH<sub>4</sub> emissions was 0.03% (18 kt CO<sub>2</sub>eq.).

<sup>15</sup> <https://unfccc.int/documents/194819>



**Figure 17. IPPU sector emission by gas, 2017**

### III.II.III. Agriculture

As referred in National Inventory Report 2019, Agricultural activities will most likely coexist with the existence of human beings on this planet, and agricultural production is indispensable to the continuance of life. Effects of climate change are observed by concentration of GHGs for many sectors including agriculture which generally comes second in size after the energy sector. The total emission value calculated for the agriculture sector is 62.5 Mt CO<sub>2</sub> eq. for the year 2017 which is 14.7% of the total emission value including LULUCF sector and 11.9% of all emissions excluding LULUCF sector for the Republic of Turkey.

The percentage of emissions from this sector as percentage of total national GHG emissions (excluding LULUCF) gradually declined from 20.8% to 10.5% in most of the years between 1990 and 2009 before levelling off.

The overall emission value for the sector increased from approximately 45.7 Mt CO<sub>2</sub> eq. to around 62.5 Mt CO<sub>2</sub> eq. (an increase of 36.9%) during the 28 years period after 1990. The biggest increase among the categories in absolute terms for the emissions is observed in the enteric fermentation category where the emissions increased by around 7.7 Mt CO<sub>2</sub> eq. (34.6%) from 22.3 Mt CO<sub>2</sub> eq. to 30.0 Mt CO<sub>2</sub> eq. for the same period. The primary reason for this increase is the change in activity data. Other significant increases in this twenty-eight years period are seen in agricultural soils, manure management, and urea application where the figures are 6.0 Mt CO<sub>2</sub> eq. (35.2%), 2.2 Mt CO<sub>2</sub> eq. (40.5%), and 1.0 Mt CO<sub>2</sub> eq. (215.2%) respectively. Increases in emissions from enteric fermentation and manure management are largely a result of changes in activity data. Emissions for rice cultivation increased by 0.1 Mt CO<sub>2</sub> eq. (133.3%) whereas the emissions for field burning of agricultural residues of 1990 and 2017 resulted in a decrease of 52.4%.

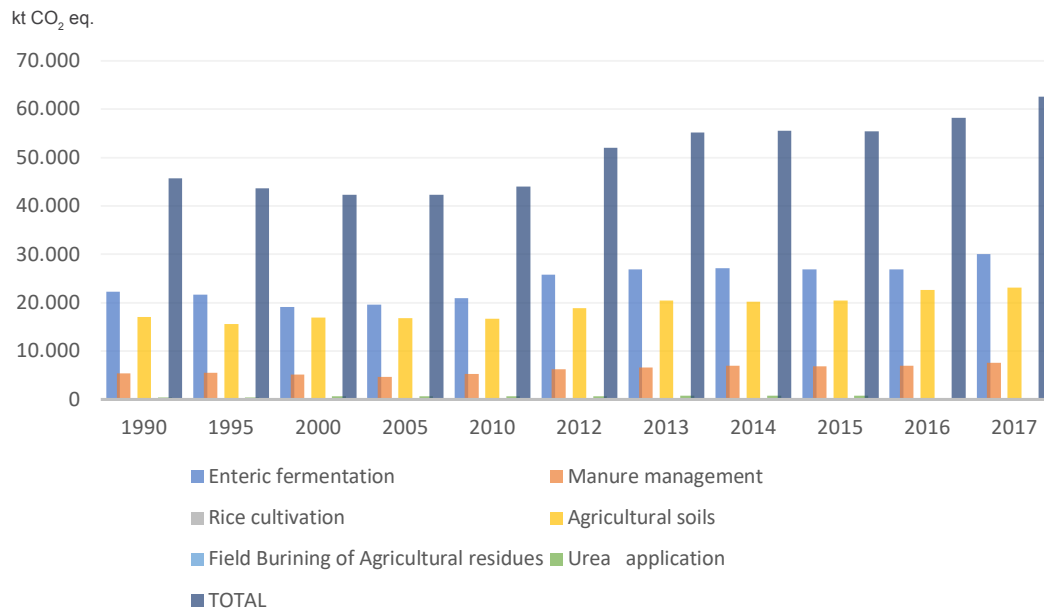


Figure 18. Overview of agriculture sector emissions, 1990-2017

### III.II. IV. LULUCF

As referred in National Inventory Report 2019, The LULUCF sector of Turkey is a net removal dominated by forests. The 22.85 Mha of forest area removed a net 90.19 Mt of CO<sub>2</sub> eq. from the atmosphere in 2017. Other land uses were net emissions while accounting less than 1 percent of forestland removals. The net removal of the sector when HWP was added has been 99.91 Mt of CO<sub>2</sub> eq. representing a 79.2 percent increase compared to 1990. The reason of the increase was increased productivity of the forests reflected by increment values.

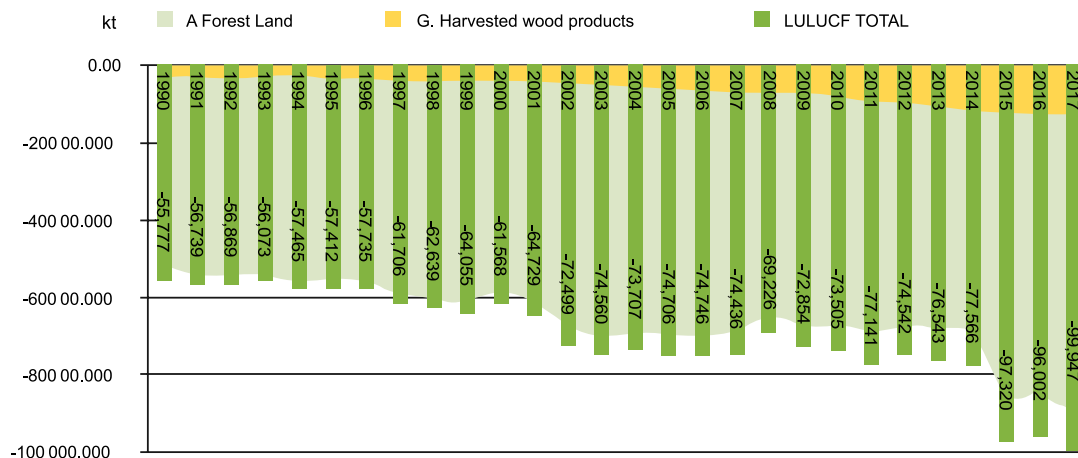


Figure 19. The trend of LULUCF sector net removals including HWP, 1990-2017<sup>16</sup>

16 <https://unfccc.int/documents/194819>



The LULUCF sector methodologies related to activity data have entirely been modified with the support of EU funded project entitled “Technical Assistance for Developed Analytical Basis for Land Use, Land Use Change and Forestry (LULUCF) Sector” started in August 2017. The project will be finished in July 2019 but so far provided significant improvements on;

- i. Developing spatially explicit land use matrices for the land uses and conversions starting from 1990,
- ii. Capacity building in relevant inventory agencies,
- iii. Development of a Program of Works, Annual Work Plan and Compendium,
- iv. A new system to calculate and report GHG emissions/removals in LULUCF sector,
- v. Activity data disaggregated into 8 Ecoregions and 28 Forest Administrative regions for higher level accuracy,
- vi. Updated NIR.

The new system increased the transparency significantly by using AD produced by an international remote sensing company, and a renewed NIR. Furthermore, the new spatially explicit land use tracking system improved completeness, accuracy and consistency because the same methodology has been used for the whole reporting period and for all land uses with around 90 percent accuracy. The new reporting system caused significant changes in emissions and removals.<sup>17</sup>

The details of the project can be seen at the project web page <https://www.lulucf-tr.org/>

### III.II.V. Waste

As referred in National Inventory Report 2019, the waste sector includes CH<sub>4</sub> emissions from solid waste disposal, CH<sub>4</sub> and N<sub>2</sub>O emissions from biological treatment of solid waste, CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emissions from open burning of waste and, CH<sub>4</sub> and N<sub>2</sub>O emissions from wastewater treatment and discharge. Emissions from waste incineration are included in the inventory but reported in the energy sector since the purpose of waste incineration is energy recovery.

Total waste emissions for the year 2017 are 17.4 Mt CO<sub>2</sub> eq., or 3.3% of total GHG emissions (without LULUCF). Within the sector, 52.3% of the emissions were from solid waste disposal, followed by 47.6% from wastewater treatment and discharge, 0.08% from biological treatment of solid waste and 0.02% from open burning of waste.



Figure 20. GHG source of waste sector

<sup>17</sup> <https://unfccc.int/documents/194819>

The major GHG emissions from the waste sector are CH<sub>4</sub> emissions, which represent 66.5% of total emissions from this sector in 2017, followed by N<sub>2</sub>O emissions with 33.5% and a very small percent of CO<sub>2</sub> as 0.01%.<sup>18</sup>

**Figure 21. Total emissions from the waste sector by source**

GHG source and sink categories	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	Total (kt CO <sub>2</sub> eq.)
Waste	1.9	11.538,7	5.814,4	17.355,0
A. Solid waste disposal	NA	9.079,1	NA	9.079,1
B. Biological treatment of solid waste	NA	8,2	5,9	14,0
C. Incineration and open burning of waste	1,9	1,7	0,3	3,9
D. Wastewater treatment and discharge	NA	2.449,8	5.808,3	8.258,1
E. Other	NO	NO	NO	NO



<sup>18</sup> <https://unfccc.int/documents/194819>



## CHAPTER IV **QUANTIFIED ECONOMY-WIDE EMISSION REDUCTION TARGET**



**A**s referred in Third Biennial Report of Turkey, the most important step to address the impact of global warming caused by human activities on climate change was the conclusion of the UNFCCC, which was opened for signature at the United Nations Environment and Development Conference, convened in 1992 in Rio de Janeiro. The Convention entered into force on March 21, 1994. More than 190 countries including Turkey and the European Union (EU) member countries are party to the Convention.

Parties to the Convention are required to reduce GHG emissions, to cooperate on research and technology and to encourage protection of sinks. The Convention lays “common but differentiated responsibilities” to countries, taking into account their respective development priorities, goals and special circumstances, in order to reduce greenhouse gases emissions. “Common but differentiated responsibilities” principle rests on the fact that some countries need to take more responsibility in reducing GHG emissions, since they have been emitting more GHG than others after the industrial revolution.

When the Convention was adopted in 1992, Turkey, as an OECD member, was included among the Annex I and Annex II countries which bear most of the burden of the commitments made under the agreement. However, Turkey did not engage actively in Convention implementation until 2001, following negotiations which resulted in UNFCCC parties agreeing that Turkey’s “special circumstances” should be recognized and that it could invoke the “common but differentiated responsibilities” principle under the Convention. As a result of decision 26/CP.7 of the UNFCCC adopted in 7th Conference of Parties held in Marrakech in 2001, Turkey was removed from Annex II of the UNFCCC and State Parties were invited to recognize the special conditions which place Turkey in a different position from other Annex I countries. This decision entered into force on June 28, 2002 and since that date Turkey is only an Annex I country. After this decision was taken, Turkey was able to adhere to the Convention ten years after its entry into force on May 24, 2004. GHG reduction commitments for the Parties, included in Annex I of the Convention, during the first commitment period ranging from 2008 to 2012 are determined in the Annex B of the Kyoto Protocol. Turkey was not Party to the Convention, during the negotiations of the Kyoto Protocol, and therefore, is not listed in the Annex-B of the Kyoto Protocol, although being listed in the Annex-I of the Convention. Turkey became a Party to the Kyoto Protocol on 26 August 2009. Since it is not listed in the Annex-B of the Protocol, Turkey does not have any quantified emission reduction target. Turkey’s responsibility under the Protocol until 2012 is only limited to the Article 10 of the Protocol. The first commitment period of the Kyoto Protocol ended in 2012. Official negotiations of the post Kyoto regime under the UNFCCC have begun at the 13th Conference of Parties to the UNFCCC in December 2007 in Bali. As successor of the Kyoto Protocol, the “Doha Amendment to the Kyoto Protocol” has been adopted at the Doha Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol on 8 December 2012.

In that respect Turkey as an Annex-I and non-Annex B country, has no quantified emission reduction target within the Kyoto Regime. Regarding the reporting in Biennial Report (BR), the BR Table 2 on description of quantified economy-wide emission reduction target is inapplicable for the case of Turkey thus is left blank throughout the report.



CHAPTER V  
**PROGRESS IN  
ACHIEVEMENT OF  
THE QUANTIFIED  
ECONOMY-WIDE  
EMISSION  
REDUCTION TARGET**

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## CHAPTER VI **PROJECTIONS**

As referred in Turkey's Seventh National Communication, On September 30th 2015, the Republic of Turkey submitted its Intended Nationally Determined Contribution (INDC) to UNFCCC towards achieving the ultimate objective of the Convention, which is set out in its Article 2 and clarifying information, in accordance with decisions 1/CP.19 and 1/CP.20. In this section, the projections of greenhouse gas emissions by 2030 are based on two scenarios: Business-As-Usual Scenario and Mitigation Scenario. The projections have been prepared based on the works done under the project called "Preparation of Turkey's Sixth National Communication on Climate Change", which was carried out by Ministry of Environment and Urbanization and the Scientific and Technological Research Council of Turkey, Marmara Research Center. TIMES-MACRO model has been used for energy related modeling and industrial processes and product use, while for Non-energy emissions different national models and studies have been used.

## IV.I. Key Assumptions

The assumptions used to estimate the projections of greenhouse gas emissions are presented in Figure 20 Turkey achieved 230% increase in GDP between 1990 and 2012. While Turkey's annual GDP growth stood at 2.10% in 2012, it is projected to reach 4% by 2030. Its population has increased to 75.6 million by more than 30% from 1990 to 2012. Turkey's energy demand increases by 6-7% each year. According to the projections by Ministry of Energy and Natural Resources, electricity demand in 2030 will reach 580 TWh under the business-as-usual scenario.

Emissions factors used to estimate greenhouse gas emissions are based on 2014 National Inventory Report published by TurkStat, 2006 IPCC Guidelines and collected data provided by various national institutions. Global warming potential on a 100-year timescale used for the calculation of CO<sub>2</sub> equivalent emissions is in accordance with the IPCC's Fourth Assessment Report.

Parameter	2012	2015	2020	2025	2030
Population (Thousand)	75.627	78.151	82.076	85.569	88.427
Population Growth	1,38%	1,07%	0,93%	0,75%	0,60%
GDP Growth	2,10%	3,50%	4,15%	4,25%	4,12%

Figure22. Key assumption used in the projections<sup>19</sup>

Current Parameters									
Assumption	Unit	2012	2015	2016	2017	2018	2020	2025	2030
Population	thousands	75.627,00	78.741,00	79.815,00	80.811,00	81.867,00	83.900,00	88.845,00	93.328,00
Population growth	%	12	13,4	13,5	12,4	14,7	-	-	-
GDP growth rate	%		4,8	3,2	7,5	2,8	-	-	-

Figure 23. Current parameters (Turkstat)

## Business-As-Usual Scenario (Without Measures)

This scenario projects greenhouse gas emissions up to 2030 based on the case of the mitigation measures which have been legalized, applied or planned since 2012 will not be implemented between 2012 and 2030. **Greenhouse gas emissions** for 1990-2012 and projected emissions up to 2030 are listed in Table 5.2 based on the type of greenhouse gas

<sup>19</sup> Base year used in the projections is 2012. Key assumptions data given in the table for years 2012 and 2015 are the input data that has been utilized for the projections, therefore they are not updated. The GHG emission projection figures for years 2020 and 2030 are based on Turkey's INDC, which has been submitted on 30 September 2015. The projections have not been updated since then. The base year for the projections is 2012. However, the GHG emission trends for 1990-2015 have been updated based on Turkey's latest GHG Inventory. The emission projections are based on GHG emissions of year 2012 which are not revised.



and sectors. CO<sub>2</sub> emissions are projected to increase about 187% by 2030 compared to 2012. CO<sub>2</sub> emissions, which were 79% of the total emissions in 2012, are projected to be 84% and 87% to total emissions in 2020 and 2030 respectively (excluding LULUCF) due to a gradual increase in energy consumption.

The ratio of CH<sub>4</sub> and N<sub>2</sub>O emissions to total emissions is 15% and 5% in 2012. The ratio of CH<sub>4</sub> emissions to total emissions is 11% and 9% in 2020 and 2030 respectively, while the ratio of N<sub>2</sub>O emissions to total emissions is 4% and 3% 2020 and 2030 respectively. On the other hand, the ratio of fluorinated gases emissions to total emissions is not expected to change much by 2030.

In business-as-usual scenario, emissions from energy consumption are projected to increase about 27.3 Mton CO<sub>2</sub>-eq. per year for 2012-2020 and about 40.5 Mton CO<sub>2</sub>-eq. per year for 2020-2030.

**Figure 24. Emissions by sector based on Business-As-Usual Scenario (Without Measures) (including LULUCF)**

										GHG emission projections - Scenarios	
		GHG emissions and removals								With measures	
GHG emissions projections	Unit	Base Year	1990	1995	2000	2005	2010	2015	2017	2020	2030
<b>Sector</b>											
Energy	kt CO <sub>2</sub> eq	134.327,90	134.327,90	162.696,10	212.330,42	240.329,11	292.323,66	339.721,86	379.900,74	538.886,82	943.547,02
Transport	kt CO <sub>2</sub> eq	26.968,90	26.968,90	34.112,99	36.464,87	42.041,16	45.391,99	75.797,65	84.659,19	101.189,82	136.512,60
Industry/industrial processes	kt CO <sub>2</sub> eq	22.893,94	22.893,94	26.128,67	26.643,60	34.633,97	49.215,31	59.574,33	66.454,60	94.750,20	169.753,80
Agriculture	kt CO <sub>2</sub> eq	42.402,30	42.402,30	40.987,45	40.032,91	40.771,65	42.826,37	53.650,01	62.542,62	51.557,04	59.277,89
Forestry/LULUCF	kt CO <sub>2</sub> eq	-28.922,68	-28.922,68	-28.906,75	-34.739,75	-42.652,80	-45.956,63	-63.668,94	-99.907,49	-40.193,25	-38.698,13
Waste management/ waste	kt CO <sub>2</sub> eq	11.090,59	11.090,59	12.382,41	14.487,23	16.919,43	18.198,35	16.984,25	17.355,03	27.900,00	40.900,00
Other Sectors											
<b>Gases</b>											
CO <sub>2</sub> emissions including net CO <sub>2</sub> from LULUCF	kt CO <sub>2</sub> eq	117.526,58	117.526,58	149.349,79	191.160,50	218.139,32	273.417,50	317.002,72	425.329,60	561.857,87	1.018.359,96
CO <sub>2</sub> emissions excluding net CO <sub>2</sub> from LULUCF	kt CO <sub>2</sub> eq	146.507,20	146.507,20	178.310,25	226.029,84	260.897,95	319.528,40	380.858,09	325.290,67	602.051,13	1.057.058,09
CH <sub>4</sub> emissions including CH <sub>4</sub> from LULUCF	kt CO <sub>2</sub> eq	42.203,66	42.203,66	42.383,98	43.525,51	45.472,89	52.467,16	52.397,82	54.193,40	76.549,20	107.651,46



CH <sub>4</sub> emissions excluding CH <sub>4</sub> from LULUCF	kt CO <sub>2</sub> eq	42.183,50	42.183,50	42.372,39	43.484,24	45.468,20	52.461,56	52.392,72	54.251,04	76.549,20	107.651,46
N <sub>2</sub> O emissions including N <sub>2</sub> O from LULUCF	kt CO <sub>2</sub> eq	21.436,50	21.436,50	20.942,66	22.684,61	23.798,22	26.038,63	29.951,30	38.535,02	25.719,86	33.049,96
N <sub>2</sub> O emissions excluding N <sub>2</sub> O from LULUCF	kt CO <sub>2</sub> eq	21.398,73	21.398,73	20.900,54	22.596,29	23.697,07	25.889,96	29.769,97	38.608,82	25.719,86	33.049,96
HFCs	kt CO <sub>2</sub> eq	NO	NO	NO	115,66	1.146,88	3.054,28	4.805,04	8.048,73	7.504,22	13.444,50
PFCs	kt CO <sub>2</sub> eq	625,30	625,30	611,44	601,00	559,96	461,74	119,72	73,11	NE	NE
SF <sub>6</sub>	kt CO <sub>2</sub> eq	NO	NO	NO	667,13	884,09	1.167,75	1.984,90	73,12	1.269,65	2.274,70
NF <sub>3</sub>	kt CO <sub>2</sub> eq	NO	NO	NO	NO	NO	NO	NO	NO	NO	NE
Other gases											
Total with LULUCF <sub>f</sub>	kt CO <sub>2</sub> eq	181.792,04	181.792,04	213.287,87	258.754,41	290.001,36	356.607,06	406.261,50	526.252,99	672.900,80	1.174.780,58
Total without LULUCF	kt CO <sub>2</sub> eq	210.714,73	210.714,73	242.194,62	293.494,16	332.654,15	402.563,69	469.930,44	426.345,50	713.094,06	1.213.478,71

**Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.**

- a. 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”, at a minimum Parties shall report a ‘with measures’ scenario, and may report ‘without measures’ and ‘with additional measures’ scenarios. If a Party chooses to report ‘without measures’ and/or ‘with additional measures’ scenarios they are to use tables 6(b) and/or 6(c), respectively. If a Party does not choose to report ‘without measures’ or ‘with additional measures’ scenarios then it should not include tables 6(b) or 6(c) in the biennial report.
- b. Emissions and removals reported in these columns should be as reported in the latest GHG inventory and consistent with the emissions and removals reported in the table on GHG emissions and trends provided in this biennial report. Where the sectoral breakdown differs from that reported in the GHG inventory Parties should explain in their biennial report how the inventory sectors relate to the sectors reported in this table.
- c. 20XX is the reporting due-date year (i.e. 2014 for the first biennial report).
- d. In accordance with paragraph 34 of 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”, projections shall be presented on a sectoral basis, to the extent possible, using the same sectoral categories used in the policies and measures section. This table should follow, to the extent possible, the same sectoral categories as those listed in paragraph 17 of those guidelines, namely, to the extent appropriate, the following sectors should be considered: energy, transport, industry, agriculture, forestry and waste management.
- e. To the extent possible, the following sectors should be used: energy, transport, industry/industrial processes, agriculture, forestry/LULUCF, waste management/waste, other sectors (i.e. cross-cutting), as appropriate.
- f. Parties may choose to report total emissions with or without LULUCF, as appropriate.



## Mitigation Scenario (With Measures)

In mitigation scenario, emissions for 2012-2030 were developed based on mitigation measures from various policy papers and strategic documents.

**Figure 25. Emissions by sector based on Mitigation Scenario (With Measures) (including LULUCF)**

GHG emissions and removals										GHG emission projections - Scenarios	
										With measures	
GHG emissions projections	Unit	Base Year	1990	1995	2000	2005	2010	2015	2017	2020	2030
Energy	kt CO <sub>2</sub> eq	134.327,90	134.327,90	162.696,10	212.330,42	240.329,11	292.323,66	339.721,86	379.900,74	499.335,53	738.265,86
Transport	kt CO <sub>2</sub> eq	26.968,90	26.968,90	34.112,99	36.464,87	42.041,16	45.391,99	75.797,65	84.659,19	101.112,82	135.994,48
Industry/ industrial processes	kt CO <sub>2</sub> eq	22.893,94	22.893,94	26.128,67	26.643,60	34.633,97	49.215,31	59.574,33	66.454,60	94.785,20	169.753,80
Agriculture	kt CO <sub>2</sub> eq	42.402,30	42.402,30	40.987,45	40.032,91	40.771,65	42.826,37	53.650,01	62.542,62	51.557,04	59.277,89
Forestry/ LULUCF	kt CO <sub>2</sub> eq	-28.922,68	-28.922,68	-28.906,75	-34.739,75	-42.652,80	-45.956,63	-63.668,94	-99.907,49	-70.035,88	-69.710,38
Waste management/ waste	kt CO <sub>2</sub> eq	11.090,59	11.090,59	12.382,41	14.487,23	16.919,43	18.198,35	16.984,25	17.355,03	23.610,00	31.400,00
Other Sectors											
Gases											
CO <sub>2</sub> emissions including net CO <sub>2</sub> from LULUCF	kt CO <sub>2</sub> eq	117.526,58	117.526,58	149.349,79	191.160,50	218.139,32	273.417,50	317.002,72	425.329,60	494.057,44	790.338,43
CO <sub>2</sub> emissions excluding net CO <sub>2</sub> from LULUCF	kt CO <sub>2</sub> eq	146.507,20	146.507,20	178.310,25	226.029,84	260.897,95	319.528,40	380.858,09	325.290,67	564.093,32	860.048,81
CH <sub>4</sub> emissions including CH <sub>4</sub> from LULUCF	kt CO <sub>2</sub> eq	42.203,66	42.203,66	42.383,98	43.525,51	45.472,89	52.467,16	52.397,82	54.193,40	71.214,67	91.824,92



CH <sub>4</sub> emissions excluding CH <sub>4</sub> from LULUCF	kt CO <sub>2</sub> eq	42.183,50	42.183,50	42.372,39	43.484,24	45.468,20	52.461,56	52.392,72	54.251,04	71.214,67	91.824,92
N <sub>2</sub> O emissions including N <sub>2</sub> O from LULUCF	kt CO <sub>2</sub> eq	21.436,50	21.436,50	20.942,66	22.684,61	23.798,22	26.038,63	29.951,30	38.535,02	25.170,91	31.104,62
N <sub>2</sub> O emissions excluding N <sub>2</sub> O from LULUCF	kt CO <sub>2</sub> eq	21.398,73	21.398,73	20.900,54	22.596,29	23.697,07	25.889,96	29.769,97	38.608,82	25.170,91	31.104,62
HFCs	kt CO <sub>2</sub> eq	NO	NO	NO	115,66	1.146,88	3.054,28	4.805,04	8,048,73	7.504,22	13.444,50
PFCs	kt CO <sub>2</sub> eq	625,30	625,30	611,44	601,00	559,96	461,74	119,72	73,11	NE	NE
SF <sub>6</sub>	kt CO <sub>2</sub> eq	NO	NO	NO	667,13	884,09	1.167,75	1.984,90	73,12	1.269,65	2.274,70
NF <sub>3</sub>	kt CO <sub>2</sub> eq	NO	NO	NO	NO	NO	NO	NO	NO	NO	NE
Other gases											
Total with LULUCF <sup>†</sup>	kt CO <sub>2</sub> eq	181.792,04	181.792,04	213.287,87	258.754,41	290.001,36	356.607,06	406.261,50	526.252,99	599.216,89	928.987,17
Total without LULUCF	kt CO <sub>2</sub> eq	210.714,73	210.714,73	242.194,62	293.494,16	332.654,15	402.563,69	469.930,44	426.345,50	669.252,77	998.697,55

**Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.**

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”, at a minimum Parties shall report a ‘with measures’ scenario, and may report ‘without measures’ and ‘with additional measures’ scenarios. If a Party chooses to report ‘without measures’ and/or ‘with additional measures’ scenarios they are to use tables 6(b) and/or 6(c), respectively. If a Party does not choose to report ‘without measures’ or ‘with additional measures’ scenarios then it should not include tables 6(b) or 6(c) in the biennial report.

- g. Emissions and removals reported in these columns should be as reported in the latest GHG inventory and consistent with the emissions and removals reported in the table on GHG emissions and trends provided in this biennial report. Where the sectoral breakdown differs from that reported in the GHG inventory Parties should explain in their biennial report how the inventory sectors relate to the sectors reported in this table.
- h. 20XX is the reporting due-date year (i.e. 2014 for the first biennial report).
- i. In accordance with paragraph 34 of 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”, projections shall be presented on a sectoral basis, to the extent possible, using the same sectoral categories used in the policies and measures section. This table should follow, to the extent possible, the same sectoral categories as those listed in paragraph 17 of those guidelines, namely, to the extent appropriate, the following sectors should be considered: energy, transport, industry, agriculture, forestry and waste management.
- j. To the extent possible, the following sectors should be used: energy, transport, industry/industrial processes, agriculture, forestry/LULUCF, waste management/waste, other sectors (i.e. cross-cutting), as appropriate.
- k. Parties may choose to report total emissions with or without LULUCF, as appropriate.



The emission reductions to be achieved by these policies and plans compared to the business as-usual scenario are presented in the figure below;

### Total Greenhouse Gas Emissions (Million Ton CO<sub>2</sub>e)

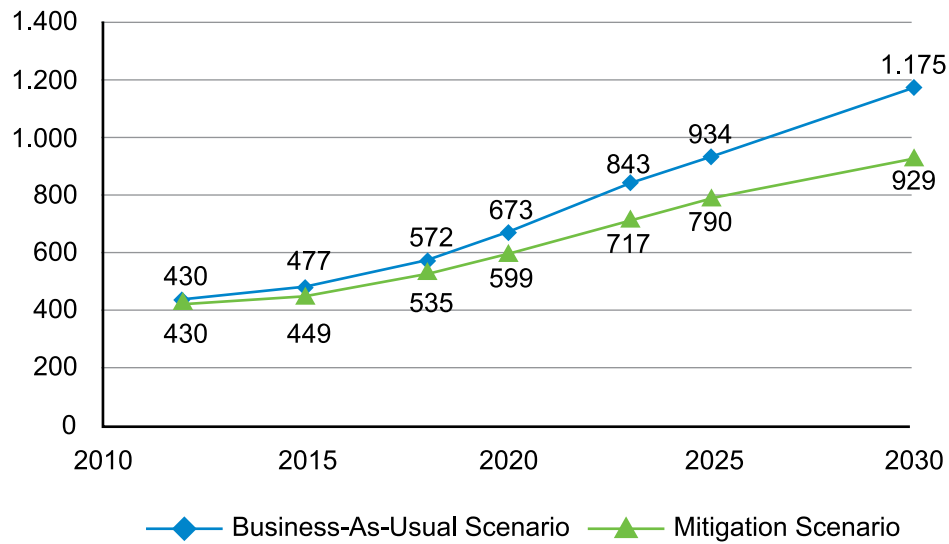


Figure 26. Turkey's INDC<sup>20</sup>





## CHAPTER VII **FINANCIAL, TECHNOLOGICAL AND CAPACITY-BUILDING SUPPORT**

**A**s mentioned in the First, Fifth, Sixth and Seventh National Communications, Turkey is not an Annex -II country, therefore doesn't have an obligation of providing support to developing countries within the scope of Articles 4.3, 4.4 and 4.5 of the Convention and Article 11 of the Kyoto Protocol.

Turkey is a developing country according to the categorization of the World Bank, the International Monetary Fund as well as the United Nations Development Programme despite being an Annex-I country within the scope of the Convention. "World Economic Situation and Prospects" Report from 2018 places Turkey in developing economies' list together with non-Annex countries while Annex-1 countries are listed as developed economies. In addition, Turkey is an OECD member while being listed among the countries which could benefit from Official Development Assistance (ODA) by the Development Assistance Committee of the OECD. Furthermore, Turkey is acknowledged as upper-middle income economy rather than developed country by Climate Technology Center and Network (CTCN).

Turkey has been a developing country in the forefront of the global outlook with an average annual GDP growth of 5% during the last decade. In order to meet the increasing need for infrastructure in a sustainable manner due to the need for development, external financing has been provided through mostly loans from bilateral agencies, multilateral development banks and climate funds for primarily renewable energy, energy efficiency and low carbon transport projects.

The Conference of Parties Decision No. 1/CP.16 recognizes special circumstances of Turkey while Decision No. 1/CP.18 confirms the importance of financial, technological and capacity building support in order to ensure effective implementation of the Convention and strongly encourages Annex-II countries to provide Turkey with financial, technological and capacity building support through multilateral organizations including the Global Environment Facility, (GEF), one of the two UNFCCC financial mechanisms and has benefitted from the Climate Investment Funds managed by the World Bank.

However, the fact that the Paris Agreement, adopted in 2015, is based on a distinction of developed/developing countries without considering any categorization, and that the special circumstances of Turkey already recognized by the Conference of Parties Decisions, are not reflected to the Agreement creates an uncertainty as far as Turkey is concerned. As a result of this uncertainty, Turkey is not able to benefit from the Green Climate Fund, which was created in 2010 as one of the funding mechanisms of the UNFCCC, and which started to support projects as of 2015, becoming the largest climate fund. Turkey has concerns that especially the increasing co-financed projects with the Multilateral Development Banks would limit its climate financing.

In this context, given its high growth potential, it is of critical importance to ensure Turkey's access to financial mechanisms under the UNFCCC, so that in addition to the funds for which it already has access, so that Turkey is able to maintain its efforts to combat climate change, realize nationally determined contribution and fulfill its high mitigation potential within the framework of common but differentiated responsibilities.<sup>21</sup>

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21 [https://unfccc.int/sites/default/files/resource/14936285\\_Turkey-NC7-2-Seventh%20National%20Communication%20of%20Turkey.pdf](https://unfccc.int/sites/default/files/resource/14936285_Turkey-NC7-2-Seventh%20National%20Communication%20of%20Turkey.pdf)



# Annex

Annex I: CTF Tables

Annex II: 2017 National Energy Balance Table

## I. CTF Tables

### a. Greenhouse gas emission (GHG) inventory and its trends

Table 1. Emission trends: summary (from CRF)

Emission trends (CO<sub>2</sub>)

Emission trends (CH<sub>4</sub>)

Emission trends (N<sub>2</sub>O)

Emission trends (HFCs, PFCs and SF<sub>6</sub>)

### b. Description of quantified economy-wide emission reduction target

Table 2(a) Description of quantified economy-wide emission reduction target: base year

Table 2(b) Gases and sectors covered

Table 2(c) Global warming potential values (GWP)

Table 2(d) Approach to counting emissions and removals from the LULUCF sector

Table 2(e)I Market-based mechanisms under the Convention

Table 2(e)II Other market-based mechanisms

Table 2(f) Any other information

### c. Progress in achievement of the target

Table 3 Progress in achievement of the quantified economy-wide emission reduction target: information on mitigation actions and their effects

Table 4 Reporting on progress

Table 4(a)I Progress in achieving the quantified economy-wide emission reduction targets – further information on mitigation actions relevant to the contribution of the land use, land-use change and forestry sector in 20XX-3 (2 tables)

Table 4(a)II Progress in achievement of the quantified economy-wide emission reduction targets – further information on mitigation actions relevant to the counting of emissions and removals from the land use, land-use change and forestry sector in relation to activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol (from CRF)

Table 4(b) Reporting on progress

## d. GHG projections

Table 5 Summary of key variables and assumptions used in the projections analysis

## e. Provision of financial, technological and capacity-building support

Table 7 Provision of public financial support: summary information in 20XX–3 (2 tables)

Table 7(a) Provision of public financial support: contribution through multilateral channels in 20XX–3 (2 tables)

Table 7(b) Provision of public financial support: contribution through bilateral, regional and other channels in 20XX–3 (2 tables)

Table 8 Provision of technology development and transfer support

Table 9 Provision of capacity-building support







**Table 1**  
**Emission trends: summary**  
**(Sheet 1 of 3)**

**TUR\_BR4\_v0.2**

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS EMISSIONS	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt CO <sub>2</sub> eq									
CO <sub>2</sub> emissions without net CO <sub>2</sub> from LULUCF	151.508,47	151.508,47	157.982,00	163.922,25	171.011,16	167.433,11	180.903,05	199.521,94	212.005,57	212.040,28
CO <sub>2</sub> emissions with net CO <sub>2</sub> from LULUCF	95.617,44	95.617,44	101.180,33	106.949,86	114.803,03	109.615,48	123.424,26	141.648,39	150.242,28	149.338,16
CH <sub>4</sub> emissions without CH <sub>4</sub> from LULUCF	42.406,91	42.406,91	43.287,21	43.194,97	42.967,48	42.685,55	42.504,55	42.856,23	42.123,45	42.314,35
CH <sub>4</sub> emissions with CH <sub>4</sub> from LULUCF	42.483,05	42.483,05	43.332,08	43.263,42	43.054,33	42.902,96	42.548,72	42.942,89	42.160,53	42.354,53
N <sub>2</sub> O emissions without N <sub>2</sub> O from LULUCF	24.661,02	24.661,02	24.445,63	24.962,10	25.767,26	23.298,02	23.565,86	24.266,89	23.892,43	25.306,81
N <sub>2</sub> O emissions with N <sub>2</sub> O from LULUCF	24.711,24	24.711,24	24.475,61	25.008,89	25.827,51	23.445,76	23.600,78	24.330,75	23.925,28	25.341,90
HFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
PFCs	625,30	625,30	863,34	722,59	403,08	710,00	611,44	577,15	574,01	615,00
Unspecified mix of HFCs and PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
SF <sub>6</sub>	NO	NO	NO	NO	NO	NO	NO	10,05	11,10	11,90
NF <sub>3</sub>	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (without LULUCF)	219.201,69	219.201,69	226.578,19	232.801,91	240.148,98	234.126,68	247.584,91	267.232,26	278.606,56	280.288,34
Total (with LULUCF)	163.437,03	163.437,03	169.851,36	175.944,76	184.087,95	176.674,20	190.185,21	209.509,24	216.913,21	217.661,48
Total (without LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



GREENHOUSE GAS EMISSIONS	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt CO <sub>2</sub> eq									
1. Energy	139.601,24	139.601,24	143.985,24	150.337,19	156.827,14	153.349,22	166.318,24	184.017,92	196.178,24	195.864,34
2. Industrial processes and product use	22.836,47	22.836,47	24.738,44	24.349,11	24.534,79	24.200,54	25.247,31	26.187,53	27.028,83	27.373,26
3. Agriculture	45.679,99	45.679,99	46.546,15	46.592,45	47.031,66	44.553,34	43.668,36	44.372,47	42.242,58	43.586,27
4. Land Use, Land-Use Change and Forestry	-55.764,67	-55.764,67	-56.726,83	-56.857,15	-56.061,03	-57.452,47	-57.399,69	-57.723,02	-61.693,35	-62.626,86
5. Waste	11.083,99	11.083,99	11.308,35	11.523,17	11.755,40	12.023,57	12.350,99	12.654,34	13.156,91	13.464,48
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (including LULUCF)	163.437,03	163.437,03	169.851,36	175.944,76	184.087,95	176.674,20	190.185,21	209.509,24	216.913,21	217.661,48





**Table 1**  
**Emission trends: summary**  
**(Sheet 2 of 3)**

**TUR\_BR4\_v0.2**

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS EMISSIONS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt CO <sub>2</sub> eq										
CO <sub>2</sub> emissions without net CO <sub>2</sub> from LULUCF	207.804,16	229.790,60	213.486,09	220.977,70	236.483,89	244.464,11	264.200,80	281.649,18	312.736,71	309.321,19	315.359,64
CO <sub>2</sub> emissions with net CO <sub>2</sub> from LULUCF	143.692,98	167.958,62	148.684,52	148.383,61	161.847,32	170.699,65	189.461,15	206.827,95	238.146,33	239.745,96	242.432,84
CH <sub>4</sub> emissions without CH <sub>4</sub> from LULUCF	43.681,12	43.561,56	42.795,48	40.864,08	42.861,37	43.491,57	45.155,78	46.584,16	48.983,64	49.889,98	49.595,43
CH <sub>4</sub> emissions with CH <sub>4</sub> from LULUCF	43.715,81	43.721,41	42.840,78	40.922,59	42.907,12	43.525,17	45.175,02	46.637,56	49.063,93	50.095,20	49.627,74
N <sub>2</sub> O emissions without N <sub>2</sub> O from LULUCF	25.656,09	24.807,80	23.291,94	23.213,53	25.025,11	25.489,40	26.131,59	28.017,08	27.393,82	25.936,31	28.168,56
N <sub>2</sub> O emissions with N <sub>2</sub> O from LULUCF	25.690,11	24.923,86	23.331,67	23.262,36	25.068,07	25.525,40	26.158,72	28.068,57	27.467,70	26.093,23	28.215,86
HFCs	NO	115,66	232,00	417,19	628,80	909,37	1.146,88	1.424,19	1.713,19	1.896,14	2.111,28
PFCs	604,82	601,00	592,20	586,39	581,79	580,13	559,96	460,96	574,44	527,72	259,26
Unspecified mix of HFCs and PFCs	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
SF <sub>6</sub>	12,36	13,34	13,16	13,95	15,16	16,44	17,67	19,40	21,04	21,98	21,30
NF <sub>3</sub>	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (without LULUCF)	277.758,55	298.889,95	280.410,86	286.072,83	305.596,13	314.951,03	337.212,68	358.154,98	391.422,85	387.593,33	395.515,46
Total (with LULUCF)	213.716,08	237.333,89	215.694,33	213.586,09	231.048,27	241.256,16	262.519,40	283.438,63	316.986,63	318.380,23	322.668,27
Total (without LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total (with LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

GREENHOUSE GAS EMISSIONS	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt CO <sub>2</sub> eq										
1. Energy	193.817,04	216.053,71	199.232,91	205.832,17	220.300,44	226.139,33	243.964,91	259.959,20	290.770,55	287.278,86	292.500,51
2. Industrial processes and product use	25.833,24	26.227,12	25.897,77	26.871,78	28.207,79	30.767,45	33.630,51	36.672,79	39.175,49	40.921,73	42.470,71
3. Agriculture	44.186,84	42.260,71	39.800,53	37.446,85	40.869,45	41.401,57	42.307,10	43.491,89	43.176,75	41.043,74	41.695,53
4. Land Use, Land-Use Change and Forestryb	-64.042,47	-61.556,06	-64.716,54	-72.486,75	-74.547,86	-73.694,87	-74.693,28	-74.716,35	-74.436,22	-69.213,10	-72.847,18
5. Waste	13.921,43	14.348,40	15.479,65	15.922,03	16.218,46	16.642,68	17.310,16	18.031,10	18.300,06	18.349,00	18.848,72
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total (including LULUCF)	213.716,08	237.333,89	215.694,33	213.586,09	231.048,27	241.256,16	262.519,40	283.438,63	316.986,63	318.380,23	322.668,27





**Table 1**  
**Emission trends: summary**  
**(Sheet 3 of 3)**

**TUR\_BR4\_v0.2**

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS EMISSIONS	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	kt CO <sub>2</sub> eq								
CO <sub>2</sub> emissions without net CO <sub>2</sub> from LULUCF	314.380,03	339.482,25	353.666,21	345.220,58	361.675,46	381.331,94	401.239,74	425.329,60	180,73
CO <sub>2</sub> emissions with net CO <sub>2</sub> from LULUCF	240.822,80	262.295,07	279.115,27	268.582,44	284.099,59	284.055,09	305.174,94	325.290,67	240,20
CH <sub>4</sub> emissions without CH <sub>4</sub> from LULUCF	51.315,18	53.686,29	57.070,27	55.450,50	57.284,61	51.333,48	53.867,21	54.193,40	27,79
CH <sub>4</sub> emissions with CH <sub>4</sub> from LULUCF	51.338,34	53.711,56	57.142,85	55.528,51	57.305,57	51.354,63	53.927,39	54.251,04	27,70
N <sub>2</sub> O emissions without N <sub>2</sub> O from LULUCF	29.425,91	30.465,07	31.556,22	33.529,97	33.935,14	34.689,71	37.067,87	38.535,02	56,26
N <sub>2</sub> O emissions with N <sub>2</sub> O from LULUCF	29.468,17	30.512,17	31.633,27	33.614,02	33.980,58	34.739,05	37.142,64	38.608,82	56,24
HFCs	3.054,28	3.432,64	4.256,83	4.470,24	4.778,45	4.636,96	6.116,92	8.048,73	100,00
PFCs	461,74	480,36	359,06	270,60	255,42	158,99	140,67	73,11	-88,31
Unspecified mix of HFCs and PFCs	NO	NO	NO	NO	NO	NO	NO	NO	0,00
SF <sub>6</sub>	23,39	25,28	26,49	26,92	32,78	39,74	36,52	73,12	100,00
NF <sub>3</sub>	NO	NO	NO	NO	NO	NO	NO	NO	0,00
Total (without LULUCF)	398.660,53	427.571,90	446.935,09	438.968,82	457.961,87	472.190,81	498.468,94	526.252,99	140,08
Total (with LULUCF)	325.168,72	350.457,09	372.533,78	362.492,74	380.452,39	374.984,46	402.539,09	426.345,50	160,86
Total (without LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	0,00
Total (with LULUCF, with indirect)	NA	NA	NA	NA	NA	NA	NA	NA	0,00

GREENHOUSE GAS EMISSIONS	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	kt CO <sub>2</sub> eq								
1. Energy	287.047,24	308.666,17	320.488,91	307.523,30	325.767,12	340.907,25	359.671,35	379.900,74	172,13
2. Industrial processes and product use	48.107,22	52.749,42	55.011,95	58.059,52	58.516,91	57.039,91	62.175,13	66.454,60	191,00
3. Agriculture	43.975,79	46.400,14	52.079,99	55.214,75	55.508,21	55.428,34	58.181,64	62.542,62	36,91
4. Land Use, Land-Use Change and Forestry	-73.491,81	-77.114,82	-74.401,31	-76.476,08	-77.509,48	-97.206,35	-95.929,85	-99.907,49	79,16
5. Waste	19.530,28	19.756,18	19.354,23	18.171,25	18.169,63	18.815,31	18.440,82	17.355,03	56,58
6. Other	NO	NO	NO	NO	NO	NO	NO	NO	0,00
Total (including LULUCF)	325.168,72	350.457,09	372.533,78	362.492,74	380.452,39	374.984,46	402.539,09	426.345,50	160,86





Table 1(a)  
Emission trends (CO<sub>2</sub>)  
(Sheet 1 of 3)

TUR\_BR4\_v0.2

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
1. Energy	129.882,32	129.882,32	134.499,96	140.775,73	147.169,81	144.117,68	156.827,07	174.383,37	186.038,62	185.609,29
A. Fuel combustion (sectoral approach)	129.661,99	129.661,99	134.236,46	140.522,09	146.938,77	143.898,66	156.617,83	174.174,83	185.832,01	185.415,05
1. Energy industries	37.130,32	37.130,32	38.662,74	43.177,66	42.609,38	48.892,06	50.297,88	54.254,01	59.382,83	64.948,14
2. Manufacturing industries and construction	37.003,99	37.003,99	40.161,67	39.167,89	39.832,38	35.740,92	39.842,82	50.376,21	55.793,93	55.221,22
3. Transport	26.250,81	26.250,81	24.982,32	25.639,91	31.268,75	29.789,14	33.179,97	35.277,22	33.702,48	31.816,76
4. Other sectors	29.276,87	29.276,87	30.429,73	32.536,63	33.228,25	29.476,54	33.297,17	34.267,40	36.952,77	33.428,93
5. Other	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
B. Fugitive emissions from fuels	220,20	220,20	263,37	253,51	230,92	218,89	209,11	208,41	206,48	194,12
1. Solid fuels	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2. Oil and natural gas and other emissions from energy production	220,20	220,20	263,37	253,51	230,92	218,89	209,11	208,41	206,48	194,12
C. CO <sub>2</sub> transport and storage	0,13	0,13	0,13	0,13	0,13	0,13	0,13	0,13	0,13	0,13
2. Industrial processes	21.139,61	21.139,61	23.018,67	22.659,96	23.185,82	22.834,19	23.624,09	24.576,67	25.395,73	25.749,11
A. Mineral industry	13.423,66	13.423,66	14.939,71	15.559,10	16.118,20	16.783,38	17.549,45	17.803,78	18.664,98	18.755,45
B. Chemical industry	565,24	565,24	523,50	523,85	465,16	385,63	472,11	451,84	464,48	444,62
C. Metal industry	6.967,34	6.967,34	7.365,01	6.413,70	6.428,53	5.491,25	5.399,71	6.097,59	6.023,95	6.345,63
D. Non-energy products from fuels and solvent use	183,37	183,37	190,44	163,32	173,93	173,93	202,82	223,46	242,33	203,41
E. Electronic industry										
F. Product uses as ODS substitutes										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H. Other	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NA	NE, NA	NE, NA
3. Agriculture	459,95	459,95	436,20	458,75	626,74	452,60	425,92	534,13	532,00	657,91
A. Enteric fermentation										
B. Manure management										
C. Rice cultivation										
D. Agricultural soils										
E. Prescribed burning of savannas										
F. Field burning of agricultural residues										
G. Liming	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
H. Urea application	459,95	459,95	436,20	458,75	626,74	452,60	425,92	534,13	532,00	657,91
I. Other carbon-containing fertilizers	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. Land Use, Land-Use Change and Forestry	-55.891,03	-55.891,03	-56.801,67	-56.972,39	-56.208,13	-57.817,63	-57.478,79	-57.873,55	-61.763,28	-62.702,13
A. Forest land	-52.956,36	-52.956,36	-54.470,07	-54.243,78	-54.477,65	-56.521,77	-55.036,25	-55.917,51	-59.061,71	-60.396,63
B. Cropland	0,69	0,69	84,45	152,69	136,89	216,95	150,24	137,37	73,35	145,16
C. Grassland	0,03	0,03	57,03	139,62	220,11	341,49	258,83	385,20	211,45	375,34
D. Wetlands	12,35	12,35	56,25	102,73	258,50	232,08	168,72	133,25	158,80	379,91
E. Settlements	NO	NO	28,46	70,12	99,42	104,87	132,20	135,15	130,67	160,32
F. Other land	NO	NO	43,91	127,77	135,49	168,59	180,62	252,96	172,81	285,17
G. Harvested wood products	-2.947,74	-2.947,74	-2.601,71	-3.321,55	-2.580,89	-2.359,84	-3.333,15	-2.999,97	-3.448,66	-3.651,38
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Waste	26,59	26,59	27,18	27,81	28,78	28,64	25,96	27,77	39,22	23,97
A. Solid waste disposal	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
B. Biological treatment of solid waste										
C. Incineration and open burning of waste	26,59	26,59	27,18	27,81	28,78	28,64	25,96	27,77	39,22	23,97
D. Waste water treatment and discharge										
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:										
International bunkers	930,78	930,78	1.138,96	1.151,44	1.290,14	1.138,84	1.394,62	1.397,47	1.870,62	2.031,47
Aviation	551,80	551,80	715,77	804,05	977,48	788,29	807,21	1.002,70	1.368,47	1.522,97
Navigation	378,98	378,98	423,19	347,39	312,66	350,55	587,41	394,77	502,15	508,50
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO <sub>2</sub> emissions from biomass	32.841,81	32.841,81	32.874,32	32.874,05	32.635,17	32.484,98	32.330,40	31.955,60	32.147,25	31.706,65
CO <sub>2</sub> captured	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
Long-term storage of C in waste disposal sites	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indirect N <sub>2</sub> O										
Indirect CO <sub>2</sub> (3)	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
Total CO <sub>2</sub> equivalent emissions without land use, land-use change and forestry	151.508,47	151.508,47	157.982,00	163.922,25	171.011,16	167.433,11	180.903,05	199.521,94	212.005,57	212.040,28
Total CO <sub>2</sub> equivalent emissions with land use, land-use change and forestry	95.617,44	95.617,44	101.180,33	106.949,86	114.803,03	109.615,48	123.424,26	141.648,39	150.242,28	149.338,16
Total CO <sub>2</sub> equivalent emissions, including indirect CO <sub>2</sub> , without land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total CO <sub>2</sub> equivalent emissions, including indirect CO <sub>2</sub> , with land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



Table 1(a)  
Emission trends (CO<sub>2</sub>)  
(Sheet 2 of 3)

TUR\_BR4\_v0.2

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt										
1. Energy	182.763,48	204.510,96	188.623,70	195.422,35	209.683,27	215.288,21	232.408,62	247.926,10	276.374,68	271.096,17	276.021,70
A. Fuel combustion (sectoral approach)	182.585,07	204.342,98	188.468,90	195.273,99	209.537,96	215.147,88	232.266,89	247.790,87	276.241,65	270.961,18	275.883,36
1. Energy industries	70.137,48	77.502,70	79.779,17	73.926,34	73.830,93	74.883,35	89.665,83	95.239,77	112.397,25	117.705,06	117.893,76
2. Manufacturing industries and construction	47.157,76	57.657,32	45.469,59	56.855,70	66.387,60	63.557,97	62.731,09	69.749,05	71.520,70	47.168,69	46.033,95
3. Transport	33.634,52	35.490,22	35.533,74	35.316,14	36.892,84	41.061,32	41.043,83	44.376,84	50.988,90	47.116,86	46.871,23
4. Other sectors	31.655,31	33.692,74	27.686,40	29.175,81	32.426,59	35.645,24	38.826,15	38.425,20	41.334,81	58.970,57	65.084,42
5. Other	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
B. Fugitive emissions from fuels	178,28	167,85	154,67	148,24	145,18	140,20	141,60	135,10	132,90	134,86	138,22
1. Solid fuels	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
2. Oil and natural gas and other emissions from energy production	178,28	167,85	154,67	148,24	145,18	140,20	141,60	135,10	132,90	134,86	138,22
C. CO <sub>2</sub> transport and storage	0,13	0,13	0,13	0,13	0,13	0,13	0,13	0,13	0,13	0,13	0,13
2. Industrial processes	24.285,85	24.641,19	24.314,70	25.015,34	26.220,05	28.536,83	31.167,14	33.116,95	35.778,82	37.642,82	38.729,97
A. Mineral industry	17.849,59	18.417,57	18.102,33	18.736,40	19.489,91	20.964,38	23.246,38	25.306,36	27.530,27	29.087,64	30.242,91
B. Chemical industry	203,83	214,27	178,71	374,48	383,51	490,98	591,29	143,26	40,62	162,88	52,34
C. Metal industry	5.982,43	5.732,24	5.819,64	5.621,46	6.071,88	6.722,40	6.883,74	7.195,65	7.758,65	8.032,65	8.038,51
D. Non-energy products from fuels and solvent use	249,99	277,11	214,02	283,01	274,75	359,07	445,74	471,68	449,28	359,66	396,21
E. Electronic industry											
F. Product uses as ODS substitutes											
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt										
H. Other	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA
3. Agriculture	733,33	617,47	527,07	526,92	565,41	632,18	613,16	592,34	566,30	564,84	592,72
A. Enteric fermentation											
B. Manure management											
C. Rice cultivation											
D. Agricultural soils											
E. Prescribed burning of savannas											
F. Field burning of agricultural residues											
G. Liming	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
H. Urea application	733,33	617,47	527,07	526,92	565,41	632,18	613,16	592,34	566,30	564,84	592,72
I. Other carbon-containing fertilizers	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. Land Use, Land-Use Change and Forestry	-64.111,18	-61.831,98	-64.801,58	-72.594,09	-74.636,57	-73.764,46	-74.739,64	-74.821,24	-74.590,38	-69.575,23	-72.926,79
A. Forest land	-61.671,78	-58.155,57	-61.518,56	-68.954,63	-70.341,49	-69.653,38	-69.387,50	-70.369,79	-69.003,24	-64.307,21	-67.433,83
B. Cropland	109,21	33,42	86,22	306,44	175,64	425,20	197,72	431,53	277,06	454,00	191,66
C. Grassland	392,80	76,31	96,61	243,04	148,48	347,21	207,53	460,45	330,39	529,64	401,13
D. Wetlands	272,53	187,05	22,15	159,25	38,11	94,85	38,47	139,06	45,37	146,17	101,72
E. Settlements	155,95	144,74	147,26	202,75	192,31	269,57	272,89	347,08	352,83	375,62	359,55
F. Other land	255,73	186,80	175,96	283,66	221,99	394,65	310,40	485,66	462,66	538,96	431,96
G. Harvested wood products	-3.625,62	-4.304,74	-3.811,23	-4.834,59	-5.071,61	-5.642,57	-6.379,15	-6.315,22	-7.055,44	-7.312,41	-6.978,99
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Waste	21,51	20,98	20,62	13,09	15,17	6,90	11,87	13,80	16,91	17,38	15,24
A. Solid waste disposal	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B. Biological treatment of solid waste											
C. Incineration and open burning of waste	21,51	20,98	20,62	13,09	15,17	6,90	11,87	13,80	16,91	17,38	15,24

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt										
D. Waste water treatment and discharge											
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:											
International bunkers	2.407,30	2.877,79	2.340,89	4.338,33	4.726,51	6.144,26	6.705,97	6.141,29	6.086,12	7.316,49	8.108,61
Aviation	1.513,51	.598,65	1.592,34	2.648,65	2.762,16	2.976,57	3.329,73	3.014,41	3.730,69	4.991,42	5.254,72
Navigation	893,79	1.279,14	748,55	1.689,68	1.964,35	3.167,69	3.376,24	3.126,88	2.355,43	2.325,07	2.853,89
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO <sub>2</sub> emissions from biomass	30.742,14	29.720,99	28.530,38	27.455,69	26.370,34	25.358,84	24.373,84	23.495,12	22.670,27	21.830,56	21.115,22
CO <sub>2</sub> captured	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE		NO, NE	NO, NE	NO, NE	NO, NE
Long-term storage of C in waste disposal sites	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indirect N <sub>2</sub> O											
Indirect CO <sub>2</sub> (3)	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
Total CO <sub>2</sub> equivalent emissions without land use, land-use change and forestry	207.804,16	229.790,60	213.486,09	220.977,70	236.483,89	244.464,11	264.200,80	281.649,18	312.736,71	309.321,19	315.359,64
Total CO <sub>2</sub> equivalent emissions with land use, land-use change and forestry	143.692,98	167.958,62	148.684,52	148.383,61	161.847,32	170.699,65	189.461,15	206.827,95	238.146,33	239.745,96	242.432,84
Total CO <sub>2</sub> equivalent emissions, including indirect CO <sub>2</sub> , without land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total CO <sub>2</sub> equivalent emissions, including indirect CO <sub>2</sub> , with land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA



Table 1(a)  
Emission trends (CO<sub>2</sub>)  
(Sheet 3 of 3)

TUR\_BR4\_v0.2

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	kt								
1. Energy	270.819,78	291.845,19	304.431,71	292.913,57	309.259,03	329.781,92	345.297,89	366.897,57	182,48
A. Fuel combustion (sectoral approach)	270.663,50	291.694,54	304.287,89	292.767,91	309.113,42	329.627,20	345.139,83	366.740,41	182,84
1. Energy industries	112.091,47	123.668,56	124.752,78	119.519,10	130.128,01	133.503,36	142.679,41	153.557,09	313,56
2. Manufacturing industries and construction	52.119,64	52.379,72	60.821,10	52.771,98	54.232,93	59.358,59	59.839,63	59.958,34	62,03
3. Transport	44.382,60	46.366,82	61.248,52	67.478,09	72.084,28	74.271,58	80.207,78	82.953,37	216,00
4. Other sectors	62.069,79	69.279,45	57.465,48	52.998,74	52.668,20	62.493,67	62.413,01	70.271,62	140,02
5. Other	IE	IE	IE	IE	IE	IE	IE	IE	0,00
B. Fugitive emissions from fuels	156,16	150,52	143,69	145,54	145,49	154,59	157,94	157,04	-28,68
1. Solid fuels	NE	NE	NE	NE	NE	NE	NE	NE	0,00
2. Oil and natural gas and other emissions from energy production	156,16	150,52	143,69	145,54	145,49	154,59	157,94	157,04	-28,68
C. CO <sub>2</sub> transport and storage	0,13	0,13	0,13	0,13	0,13	0,13	0,13	0,13	0,00
2. Industrial processes	42.904,06	47.065,42	48.580,31	51.492,34	51.628,26	50.738,36	54.644,66	56.980,49	169,54
A. Mineral industry	33.393,75	35.297,58	36.384,39	39.618,06	39.854,59	38.479,19	42.004,43	44.274,13	229,82
B. Chemical industry	249,56	1.011,98	1.191,96	792,81	976,19	1.337,23	940,02	741,68	31,22
C. Metal industry	8.829,16	9.902,12	10.398,44	10.547,89	10.398,33	10.655,43	11.553,99	11.813,15	69,55
D. Non-energy products from fuels and solvent use	431,59	853,74	605,52	533,59	399,16	266,50	146,22	151,53	-17,36
E. Electronic industry									
F. Product uses as ODS substitutes									
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	NA		

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	kt								
H. Other	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	0,00
3. Agriculture	644,98	557,55	639,77	807,30	787,69	810,59	1.295,35	1.449,63	215,17
A. Enteric fermentation									
B. Manure management									
C. Rice cultivation									
D. Agricultural soils									
E. Prescribed burning of savannas									
F. Field burning of agricultural residues									
G. Liming	NE	NE	NE	NE	NE	NE	NE	NE	0,00
H. Urea application	644,98	557,55	639,77	807,30	787,69	810,59	1.295,35	1.449,63	215,17
I. Other carbon-containing fertilizers	NE	NE	NE	NE	NE	NE	NE	NE	0,00
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	0,00
4. Land Use, Land-Use Change and Forestry	-73.557,24	-77.187,18	-74.550,94	-76.638,15	-77.575,87	-97.276,85	-96.064,80	-100.038,93	78,99
A. Forest land	-67.652,00	-69.429,50	-67.273,01	-68.041,75	-68.133,86	-87.703,79	-85.332,50	-90.290,21	70,50
B. Cropland	435,48	186,10	405,08	197,49	287,37	436,72	322,37	346,26	50.050,43
C. Grassland	543,49	328,71	567,49	405,97	686,87	917,82	582,61	630,81	2.286,147,84
D. Wetlands	423,63	195,69	748,46	445,36	226,23	89,61	339,83	323,58	2.520,03
E. Settlements	425,72	393,76	435,34	397,46	420,32	419,22	405,58	412,62	100,00
F. Other land	600,58	440,93	647,65	539,99	564,57	763,97	617,32	653,05	100,00
G. Harvested wood products	-8.334,14	-9.302,87	-10.081,96	-10.582,68	-11.627,37	-12.200,40	-13.000,00	-12.115,04	310,99
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	0,00
5. Waste	11,21	14,09	14,42	7,37	0,48	1,07	1,84	1,91	-92,82
A. Solid waste disposal	NA	NA	NA	NA	NA	NA	NA	NA	0,00
B. Biological treatment of solid waste									
C. Incineration and open burning of waste	11,21	14,09	14,42	7,37	0,48	1,07	1,84	1,91	-92,82
D. Waste water treatment and discharge									
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	0,00
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	0,00



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	kt								
Memo items:									
International bunkers	8.265,77	8.720,45	10.302,77	11.552,99	13.182,48	13.827,13	13.635,78	13.885,54	1.391,82
Aviation	5.858,47	6.769,01	7.684,30	8.660,75	9.922,40	11.085,16	10.629,74	11.014,81	1.896,15
Navigation	2.407,30	1.951,44	2.618,47	2.892,24	3.260,08	2.741,97	3.006,04	2.870,73	657,49
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	0,00
CO <sub>2</sub> emissions from biomass	20.326,31	15.628,03	15.295,59	14.955,92	14.395,52	12.771,31	11.940,31	10.747,64	-67,27
CO <sub>2</sub> captured	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	0,00
Long-term storage of C in waste disposal sites	NA	NA	NA	NA	NA	NA	NA	NA	0,00
Indirect N <sub>2</sub> O									
Indirect CO <sub>2</sub> (3)	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NE	0,00
Total CO <sub>2</sub> equivalent emissions without land use, land-use change and forestry	314.380,03	339.482,25	353.666,21	345.220,58	361.675,46	381.331,94	401.239,74	425.329,60	180,73
Total CO <sub>2</sub> equivalent emissions with land use, land-use change and forestry	240.822,80	262.295,07	279.115,27	268.582,44	284.099,59	284.055,09	305.174,94	325.290,67	240,20
Total CO <sub>2</sub> equivalent emissions, including indirect CO <sub>2</sub> , without land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	0,00
Total CO <sub>2</sub> equivalent emissions, including indirect CO <sub>2</sub> , with land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	0,00

Abbreviations: CRF = common reporting format, LULUCF = land use, land-use change and forestry.

<sup>a</sup> The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the Conference of the Parties. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.

<sup>b</sup> Fill in net emissions/removals as reported in CRF table Summary 1.A of the latest reported inventory year. For the purposes of reporting, the signs for removals are always negative (-) and for emissions positive (+).

Table 1(b)  
Emission trends (CH<sub>4</sub>)  
(Sheet 1 of 3)

TUR\_BR4\_v0.2

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
1. Energy	310,81	310,81	301,63	303,09	296,02	280,02	286,22	286,30	305,07	311,20
A. Fuel combustion (sectoral approach)	139,26	139,26	140,22	143,49	139,95	128,86	133,72	132,28	138,79	129,21
1. Energy industries	0,44	0,44	0,45	0,49	0,50	0,57	0,59	0,63	0,70	0,77
2. Manufacturing industries and construction	2,17	2,17	2,38	2,14	2,10	1,84	2,06	2,88	3,24	3,46
3. Transport	3,95	3,95	3,81	4,16	5,00	4,94	5,45	5,86	7,02	7,46
4. Other sectors	132,70	132,70	133,58	136,70	132,35	121,52	125,61	122,91	127,84	117,52
5. Other	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
B. Fugitive emissions from fuels	171,55	171,55	161,41	159,60	156,06	151,16	152,50	154,02	166,28	182,00
1. Solid fuels	143,93	143,93	128,77	127,09	124,56	119,93	119,40	118,69	127,49	142,59
2. Oil and natural gas and other emissions from energy production	27,62	27,62	32,64	32,51	31,51	31,23	33,11	35,33	38,79	39,41
C. CO <sub>2</sub> transport and storage										
2. Industrial processes	0,32	0,32	0,30	0,31	0,31	0,32	0,30	0,33	0,34	0,32
A. Mineral industry										
B. Chemical industry	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C. Metal industry	0,32	0,32	0,30	0,31	0,31	0,31	0,30	0,32	0,34	0,32
D. Non-energy products from fuels and solvent use	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NE, NA	NA, NE	NA, NE	NA, NE
E. Electronic industry										



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
F. Product uses as ODS substitutes										
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H. Other	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE
3. Agriculture	1.001,26	1.001,26	1.037,74	1.024,56	1.013,55	1.009,22	983,87	984,82	916,05	907,43
A. Enteric fermentation	892,56	892,56	925,17	917,18	901,44	889,40	868,19	867,10	808,15	791,24
B. Manure management	94,08	94,08	97,62	93,20	96,81	106,43	101,04	102,18	92,33	99,10
C. Rice cultivation	4,01	4,01	3,99	3,76	4,06	3,59	4,50	5,03	4,97	5,41
D. Agricultural soils	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	10,60	10,60	10,96	10,43	11,23	9,80	10,14	10,52	10,61	11,68
G. Liming										
H. Urea application										
I. Other carbon-containing fertilizers										
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. Land Use, Land-Use Change and Forestry	3,05	3,05	1,79	2,74	3,47	8,70	1,77	3,47	1,48	1,61
A. Forest land	3,05	3,05	1,79	2,74	3,47	8,70	1,77	3,47	1,48	1,61
B. Cropland	NO, NE, IE	NO, NE, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE
C. Grassland	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Wetlands	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Settlements	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
G. Harvested wood products										



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Waste	383,89	383,89	391,82	399,83	408,82	417,87	429,79	442,81	463,47	473,62
A. Solid waste disposal	269,18	269,18	275,74	282,39	290,04	297,77	305,12	317,13	331,64	348,53
B. Biological treatment of solid waste	0,45	0,45	0,45	0,45	0,45	0,45	0,37	0,42	0,42	0,39
C. Incineration and open burning of waste	2,69	2,69	2,74	2,78	2,83	2,87	2,63	2,85	4,06	2,51
D. Waste water treatment and discharge	111,56	111,56	112,90	114,21	115,50	116,78	121,67	122,42	127,35	122,19
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total CH <sub>4</sub> emissions without CH <sub>4</sub> from LULUCF	1.696,28	1.696,28	1.731,49	1.727,80	1.718,70	1.707,42	1.700,18	1.714,25	1.684,94	1.692,57
Total CH <sub>4</sub> emissions with CH <sub>4</sub> from LULUCF	1.699,32	1.699,32	1.733,28	1.730,54	1.722,17	1.716,12	1.701,95	1.717,72	1.686,42	1.694,18
Memo items:										
International bunkers	0,04	0,04	0,04	0,04	0,04	0,04	0,06	0,04	0,06	0,06
Aviation	0,00	0,00	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
Navigation	0,04	0,04	0,04	0,03	0,03	0,03	0,05	0,04	0,05	0,05
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO <sub>2</sub> emissions from biomass										
CO <sub>2</sub> captured										
Long-term storage of C in waste disposal sites										
Indirect N <sub>2</sub> O										
Indirect CO <sub>2</sub> (3)										



Table 1(b)  
Emission trends (CH<sub>4</sub>)  
(Sheet 2 of 3)

TUR\_BR4\_v0.2

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt										
1. Energy	343,31	360,78	330,17	320,76	314,24	314,21	337,54	347,31	425,04	485,16	492,23
A. Fuel combustion (sectoral approach)	121,65	121,71	108,29	110,02	112,46	114,46	113,15	109,31	112,41	154,19	172,65
1. Energy industries	0,85	0,97	1,00	0,95	0,98	1,00	1,20	1,29	1,54	1,57	1,70
2. Manufacturing industries and construction	2,87	3,91	2,59	3,58	4,13	4,20	3,85	4,76	5,05	2,63	2,72
3. Transport	7,78	8,91	8,43	7,86	8,08	8,35	8,59	9,22	10,45	10,53	10,96
4. Other sectors	110,15	107,92	96,27	97,62	99,27	100,92	99,51	94,04	95,38	139,45	157,26
5. Other	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
B. Fugitive emissions from fuels	221,66	239,07	221,88	210,75	201,78	199,75	224,40	237,99	312,62	330,97	319,57
1. Solid fuels	179,25	193,45	175,48	162,38	146,57	142,73	157,63	164,78	229,02	244,73	242,44
2. Oil and natural gas and other emissions from energy production	42,41	45,62	46,40	48,37	55,20	57,02	66,77	73,21	83,61	86,23	77,13
C. CO <sub>2</sub> transport and storage											
2. Industrial processes	0,31	0,35	0,33	0,30	0,32	0,33	0,37	0,35	0,37	0,38	0,36
A. Mineral industry											
B. Chemical industry	0,00	0,00	0,00	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA
C. Metal industry	0,30	0,35	0,33	0,30	0,32	0,33	0,37	0,35	0,37	0,38	0,36
D. Non-energy products from fuels and solvent use	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE
E. Electronic industry											

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt										
F. Product uses as ODS substitutes											
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
H. Other	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE
3. Agriculture	912,51	873,82	855,79	771,23	843,43	850,31	881,46	912,73	925,35	903,14	885,71
A. Enteric fermentation	794,02	764,96	744,25	675,14	738,56	758,27	786,52	813,23	822,10	802,28	783,06
B. Manure management	102,17	93,35	96,55	80,68	89,21	74,82	78,36	82,03	87,32	84,32	85,50
C. Rice cultivation	5,87	5,12	5,28	5,40	5,72	6,25	7,34	8,48	8,11	8,64	8,35
D. Agricultural soils	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	10,46	10,39	9,71	10,01	9,94	10,97	9,24	8,98	7,81	7,91	8,80
G. Liming											
H. Urea application											
I. Other carbon-containing fertilizers											
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. Land Use, Land-Use Change and Forestry	1,39	6,39	1,81	2,34	1,83	1,34	0,77	2,14	3,21	8,21	1,29
A. Forest land	1,39	6,39	1,81	2,34	1,83	1,34	0,77	2,14	3,21	8,21	1,29
B. Cropland	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE
C. Grassland	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
D. Wetlands	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Settlements	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
G. Harvested wood products											
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Waste	491,12	507,51	525,53	542,28	556,46	574,81	586,85	602,98	608,60	606,91	605,52



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt										
A. Solid waste disposal	366,50	383,26	400,69	417,17	432,08	448,54	462,48	476,67	484,81	487,25	485,70
B. Biological treatment of solid waste	0,53	0,56	0,51	0,89	0,76	0,82	0,66	0,42	0,78	0,57	0,74
C. Incineration and open burning of waste	2,28	2,25	2,23	1,43	1,68	0,66	1,18	1,60	1,64	1,56	1,27
D. Waste water treatment and discharge	121,82	121,44	122,09	122,78	121,94	124,79	122,53	124,29	121,37	117,53	117,83
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total CH <sub>4</sub> emissions without CH <sub>4</sub> from LULUCF	1.747,24	1.742,46	1.711,82	1.634,56	1.714,45	1.739,66	1.806,23	1.863,37	1.959,35	1.995,60	1.983,82
Total CH <sub>4</sub> emissions with CH <sub>4</sub> from LULUCF	1.748,63	1.748,86	1.713,63	1.636,90	1.716,28	1.741,01	1.807,00	1.865,50	1.962,56	2.003,81	1.985,11
Memo items:											
International bunkers	0,09	0,13	0,08	0,17	0,20	0,31	0,34	0,31	0,24	0,25	0,29
Aviation	0,01	0,01	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04
Navigation	0,08	0,12	0,07	0,16	0,18	0,29	0,31	0,29	0,21	0,21	0,26
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO <sub>2</sub> emissions from biomass											
CO <sub>2</sub> captured											
Long-term storage of C in waste disposal sites											
Indirect N <sub>2</sub> O											
Indirect CO <sub>2</sub> (3)											

Table 1(b)  
Emission trends (CH<sub>4</sub>)  
(Sheet 3 of 3)

TUR\_BR4\_v0.2

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	kt								
1. Energy	491,18	504,38	525,35	466,59	533,66	296,12	419,76	355,66	14,43
A. Fuel combustion (sectoral approach)	168,41	147,84	155,87	131,49	130,85	82,48	82,27	94,02	-32,49
1. Energy industries	1,70	1,89	1,88	1,79	1,89	1,93	2,00	2,07	373,18
2. Manufacturing industries and construction	3,00	2,91	3,28	2,92	2,93	3,25	3,30	3,18	46,83
3. Transport	11,44	11,49	12,60	13,03	13,62	14,54	15,41	15,38	288,94
4. Other sectors	152,26	131,55	138,11	113,75	112,41	62,76	61,56	73,39	-44,70
5. Other	IE	IE	IE	IE	IE	IE	IE	IE	0,00
B. Fugitive emissions from fuels	322,77	356,54	369,48	335,10	402,81	213,64	337,49	261,64	52,52
1. Solid fuels	246,03	266,47	274,04	252,98	292,74	109,31	235,83	147,26	2,31
2. Oil and natural gas and other emissions from energy production	76,75	90,08	95,44	82,12	110,08	104,33	101,66	114,39	314,11
C. CO <sub>2</sub> transport and storage									
2. Industrial processes	0,41	0,45	0,51	0,53	0,55	0,60	0,69	0,65	106,04
A. Mineral industry									
B. Chemical industry	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	NO, IE, NA	
C. Metal industry	0,41	0,45	0,51	0,53	0,55	0,60	0,69	0,65	107,24
D. Non-energy products from fuels and solvent use	NA, NE	NA, NE	NA, NE	NA, NE	NE, NA	NE, NA	NE, NA	NE, NA	0,00
E. Electronic industry									
F. Product uses as ODS substitutes									
G. Other product manufacture and use	NA	NA	NA	NA	NA	NA	NA		



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	kt								
H. Other	NA, NE	NA, NE	NA, NE	NA, NE	NE, NA	NE, NA	NE, NA	NE, NA	0,00
3. Agriculture	950,10	1.025,64	1.159,88	1.210,44	1.226,07	1.211,67	1.216,17	1.349,87	34,82
A. Enteric fermentation	836,49	912,25	1.029,59	1.074,02	1.083,78	1.075,52	1.076,94	1.201,57	34,62
B. Manure management	98,83	98,09	113,50	119,86	126,53	121,24	124,48	133,91	42,33
C. Rice cultivation	8,09	8,17	9,96	9,23	9,18	9,60	9,72	9,35	133,32
D. Agricultural soils	NO	NO	NO	NO	NO	NO	NO	NO	0,00
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	0,00
F. Field burning of agricultural residues	6,69	7,12	6,83	7,34	6,58	5,32	5,03	5,04	-52,44
G. Liming									
H. Urea application									
I. Other carbon-containing fertilizers									
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	0,00
4. Land Use, Land-Use Change and Forestry	0,93	1,01	2,90	3,12	0,84	0,85	2,41	2,31	-24,30
A. Forest land	0,93	1,01	2,90	3,12	0,84	0,85	2,41	2,31	-24,30
B. Cropland	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	0,00
C. Grassland	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	0,00
D. Wetlands	NO	NO	NO	NO	NO	NO	NO	NO	0,00
E. Settlements	NO	NO	NO	NO	NO	NO	NO	NO	0,00
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	0,00
G. Harvested wood products									
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	0,00
5. Waste	610,92	616,99	597,07	540,45	531,10	544,95	518,07	461,55	20,23
A. Solid waste disposal	490,89	498,33	478,78	434,78	433,63	449,26	420,50	363,16	34,91
B. Biological treatment of solid waste	0,54	0,68	0,42	0,37	0,35	0,37	0,36	0,33	-27,03
C. Incineration and open burning of waste	0,87	0,79	0,68	0,36	0,03	0,04	0,07	0,07	-97,54
D. Waste water treatment and discharge	118,62	117,19	117,19	104,95	97,09	95,27	97,14	97,99	-12,16

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	kt								
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	0,00
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	0,00
Memo items:	2.052,61	2.147,45	2.282,81	2.218,02	2.291,38	2.053,34	2.154,69	2.167,74	27,79
International bunkers	2.053,53	2.148,46	2.285,71	2.221,14	2.292,22	2.054,19	2.157,10	2.170,04	27,70
Aviation									
Navigation	0,26	0,22	0,29	0,32	0,36	0,33	0,34	0,34	766,79
Multilateral operations	0,04	0,05	0,05	0,06	0,07	0,08	0,07	0,08	1.895,51
CO <sub>2</sub> emissions from biomass	0,22	0,18	0,24	0,26	0,29	0,25	0,27	0,26	643,36
CO <sub>2</sub> captured	NO	NO	NO	NO	NO	NO	NO	NO	0,00
Long-term storage of C in waste disposal sites									
Indirect N <sub>2</sub> O									
Indirect CO <sub>2</sub> (3)									
Total CO <sub>2</sub> equivalent emissions without land use, land-use change and forestry									
Total CO <sub>2</sub> equivalent emissions with land use, land-use change and forestry									
Total CO <sub>2</sub> equivalent emissions, including indirect CO <sub>2</sub> , without land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	0,00
Total CO <sub>2</sub> equivalent emissions, including indirect CO <sub>2</sub> , with land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	0,00

Abbreviations: CRF = common reporting format, LULUCF = land use, land-use change and forestry.

<sup>a</sup> The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the Conference of the Parties. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.





Table 1(c)  
Emission trends (N<sub>2</sub>O)  
(Sheet 1 of 3)

TUR\_BR4\_v0.2

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
1. Energy	6,54	6,54	6,53	6,66	7,57	7,49	7,84	8,31	8,43	8,31
A. Fuel combustion (sectoral approach)	6,54	6,54	6,52	6,65	7,57	7,48	7,83	8,31	8,43	8,30
1. Energy industries	0,38	0,38	0,39	0,45	0,44	0,51	0,51	0,56	0,61	0,66
2. Manufacturing industries and construction	0,35	0,35	0,38	0,34	0,34	0,30	0,34	0,46	0,52	0,55
3. Transport	2,08	2,08	2,00	2,09	2,51	2,44	2,67	2,85	2,72	2,61
4. Other sectors	3,73	3,73	3,75	3,77	4,28	4,23	4,31	4,44	4,58	4,49
5. Other	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
B. Fugitive emissions from fuels	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
1. Solid fuels	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
2. Oil and natural gas and other emissions from energy production	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C. CO <sub>2</sub> transport and storage										
2. Industrial processes	3,57	3,57	2,85	3,22	3,15	2,18	3,37	3,41	3,49	3,32
A. Mineral industry										
B. Chemical industry	3,57	3,57	2,85	3,22	3,15	2,18	3,37	3,41	3,49	3,32
C. Metal industry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D. Non-energy products from fuels and solvent use	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE
E. Electronic industry										
F. Product uses as ODS substitutes										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
G. Other product manufacture and use	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3. Agriculture	67,75	67,75	67,67	68,86	70,69	63,32	62,57	64,49	63,12	67,93
A. Enteric fermentation										
B. Manure management	10,11	10,11	10,58	10,53	10,46	10,32	9,85	9,93	9,38	9,48
C. Rice cultivation										
D. Agricultural soils	57,36	57,36	56,81	58,06	59,95	52,75	52,46	54,28	53,47	58,14
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	0,27	0,27	0,28	0,27	0,29	0,25	0,26	0,27	0,28	0,30
G. Liming										
H. Urea application										
I. Other carbon-containing fertilizers										
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. Land Use, Land-Use Change and Forestry	0,17	0,17	0,10	0,16	0,20	0,50	0,12	0,21	0,11	0,12
A. Forest land	0,17	0,17	0,10	0,15	0,19	0,48	0,10	0,19	0,08	0,09
B. Cropland	NO, IE	NO, IE	0,00	0,00	0,00	0,01	0,01	0,01	0,01	0,01
C. Grassland	NO, NE	NO, NE	0,00	0,00	0,01	0,01	0,01	0,01	0,01	0,01
D. Wetlands	NO	NO	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
E. Settlements	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
G. Harvested wood products										
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Waste	4,90	4,90	4,99	5,03	5,05	5,20	5,30	5,22	5,14	5,37
A. Solid waste disposal										



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
B. Biological treatment of solid waste	0,03	0,03	0,03	0,03	0,03	0,03	0,02	0,03	0,03	0,02
C. Incineration and open burning of waste	0,04	0,04	0,04	0,04	0,04	0,04	0,04	0,04	0,06	0,04
D. Waste water treatment and discharge	4,84	4,84	4,92	4,97	4,99	5,13	5,24	5,16	5,05	5,31
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Memo items:	82,76	82,76	82,03	83,77	86,47	78,18	79,08	81,43	80,18	84,92
International bunkers	82,92	82,92	82,13	83,92	86,67	78,68	79,20	81,65	80,29	85,04
Aviation										
Navigation	0,03	0,03	0,03	0,03	0,04	0,03	0,04	0,04	0,05	0,06
Multilateral operations	0,02	0,02	0,02	0,02	0,03	0,02	0,02	0,03	0,04	0,04
CO <sub>2</sub> emissions from biomass	0,01	0,01	0,01	0,01	0,01	0,01	0,02	0,01	0,01	0,01
CO <sub>2</sub> captured	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Long-term storage of C in waste disposal sites										
Indirect N <sub>2</sub> O										
Indirect CO <sub>2</sub> (3)										
Total CO <sub>2</sub> equivalent emissions without land use, land-use change and forestry	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
Total CO <sub>2</sub> equivalent emissions with land use, land-use change and forestry										
Total CO <sub>2</sub> equivalent emissions, including indirect CO <sub>2</sub> , without land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total CO <sub>2</sub> equivalent emissions, including indirect CO <sub>2</sub> , with land use, land-use change and forestry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 1(c)  
Emission trends (N<sub>2</sub>O)  
(Sheet 2 of 3)

TUR\_BR4\_v0.2

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt										
1. Energy	8,29	8,47	7,90	8,02	9,27	10,05	10,46	11,24	12,65	13,60	14,00
A. Fuel combustion (sectoral approach)	8,29	8,46	7,90	8,02	9,26	10,05	10,46	11,24	12,65	13,60	14,00
1. Energy industries	0,68	0,72	0,73	0,63	1,73	2,12	2,56	2,88	3,81	4,01	4,51
2. Manufacturing industries and construction	0,46	0,61	0,41	0,56	0,64	0,65	0,59	0,73	0,76	0,40	0,42
3. Transport	2,65	2,52	2,38	2,42	2,45	2,61	2,63	2,74	2,85	2,64	2,56
4. Other sectors	4,51	4,61	4,38	4,41	4,44	4,67	4,68	4,90	5,23	6,55	6,52
5. Other	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE	IE
B. Fugitive emissions from fuels	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
1. Solid fuels	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
2. Oil and natural gas and other emissions from energy production	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C. CO <sub>2</sub> transport and storage											
2. Industrial processes	3,10	2,84	2,47	2,79	2,53	2,40	2,45	5,51	3,62	2,76	4,50
A. Mineral industry											
B. Chemical industry	3,10	2,84	2,47	2,79	2,53	2,40	2,45	5,51	3,62	2,76	4,50
C. Metal industry	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D. Non-energy products from fuels and solvent use	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE	NA, NE
E. Electronic industry											



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt										
F. Product uses as ODS substitutes											
G. Other product manufacture and use	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3. Agriculture	69,26	66,44	60,00	59,19	64,49	65,48	65,96	67,39	65,36	60,07	63,62
A. Enteric fermentation											
B. Manure management	9,57	9,28	8,84	8,27	8,98	8,85	9,17	9,60	9,39	9,12	8,83
C. Rice cultivation											
D. Agricultural soils	59,42	56,89	50,90	50,67	55,25	56,34	56,56	57,55	55,76	50,75	54,57
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field burning of agricultural residues	0,27	0,27	0,25	0,26	0,26	0,28	0,24	0,23	0,20	0,20	0,23
G. Liming											
H. Urea application											
I. Other carbon-containing fertilizers											
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
4. Land Use, Land-Use Change and Forestry	0,11	0,39	0,13	0,16	0,14	0,12	0,09	0,17	0,25	0,53	0,16
A. Forest land	0,08	0,35	0,10	0,13	0,10	0,07	0,04	0,12	0,18	0,45	0,07
B. Cropland	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,04	0,05	0,05
C. Grassland	0,02	0,02	0,01	0,01	0,02	0,01	0,01	0,01	0,02	0,02	0,03
D. Wetlands	0,00	0,00	0,00	0,00	0,00	0,01	0,01	0,01	0,01	0,01	0,01
E. Settlements	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
G. Harvested wood products											

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	kt										
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Waste	5,44	5,50	7,79	7,89	7,69	7,60	8,82	9,88	10,30	10,60	12,40
A. Solid waste disposal											
B. Biological treatment of solid waste	0,03	0,03	0,03	0,05	0,05	0,05	0,04	0,03	0,05	0,03	0,04
C. Incineration and open burning of waste	0,03	0,03	0,03	0,02	0,03	0,01	0,02	0,03	0,03	0,02	0,02
D. Waste water treatment and discharge	5,38	5,44	7,72	7,82	7,62	7,54	8,76	9,82	10,22	10,54	12,34
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Total CH <sub>4</sub> emissions without CH <sub>4</sub> from LULUCF	86,09	83,25	78,16	77,90	83,98	85,53	87,69	94,02	91,93	87,03	94,53
Total CH <sub>4</sub> emissions with CH <sub>4</sub> from LULUCF	86,21	83,64	78,29	78,06	84,12	85,66	87,78	94,19	92,17	87,56	94,68
Memo items:											
International bunkers	0,07	0,08	0,06	0,12	0,13	0,17	0,18	0,17	0,16	0,20	0,22
Aviation	0,04	0,04	0,04	0,07	0,08	0,08	0,09	0,08	0,10	0,14	0,15
Navigation	0,02	0,03	0,02	0,04	0,05	0,08	0,09	0,08	0,06	0,06	0,07
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO <sub>2</sub> emissions from biomass											
CO <sub>2</sub> captured											
Long-term storage of C in waste disposal sites											
Indirect N <sub>2</sub> O	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE
Indirect CO <sub>2</sub> (3)											



Table 1(c)  
Emission trends (N<sub>2</sub>O)  
(Sheet 3 of 3)

TUR\_BR4\_v0.2

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	%								
1. Energy	13,25	14,13	9,81	9,88	10,63	12,49	13,02	13,80	111,00
A. Fuel combustion (sectoral approach)	13,25	14,13	9,81	9,88	10,62	12,49	13,02	13,80	111,07
1. Energy industries	3,99	4,23	3,84	4,06	4,36	3,86	4,14	4,57	1.117,46
2. Manufacturing industries and construction	0,46	0,44	0,50	0,45	0,44	0,49	0,50	0,48	37,55
3. Transport	2,43	2,46	3,23	3,56	3,81	3,90	4,19	4,43	113,38
4. Other sectors	6,36	7,01	2,24	1,82	2,02	4,24	4,19	4,31	15,42
5. Other	IE	IE	IE	IE	IE	IE	IE	IE	0,00
B. Fugitive emissions from fuels	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-30,99
1. Solid fuels	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	NO, NE	0,00
2. Oil and natural gas and other emissions from energy production	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	-30,99
C. CO <sub>2</sub> transport and storage									
2. Industrial processes	5,55	5,82	5,96	5,99	6,07	4,87	4,09	4,24	18,73
A. Mineral industry									
B. Chemical industry	5,55	5,82	5,96	5,99	6,07	4,87	4,09	4,24	18,73
C. Metal industry	NA	NA	NA	NA	NA	NA	NA		
D. Non-energy products from fuels and solvent use	NA, NE	NA, NE	NA, NE	NA, NE	NE, NA	NE, NA	NE, NA	NE, NA	0,00
E. Electronic industry									
F. Product uses as ODS substitutes									
G. Other product manufacture and use	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NO, NE, NA	NE, NA		

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	%								
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	0,00
3. Agriculture	65,70	67,79	75,31	81,03	80,77	81,63	88,87	91,77	35,45
A. Enteric fermentation									
B. Manure management	9,46	10,31	11,61	12,21	12,62	12,69	12,75	14,06	39,06
C. Rice cultivation									
D. Agricultural soils	56,07	57,30	63,52	68,63	67,97	68,81	75,98	77,57	35,24
E. Prescribed burning of savannas	NO	NO	NO	NO	NO	NO	NO	NO	0,00
F. Field burning of agricultural residues	0,17	0,18	0,18	0,19	0,17	0,14	0,13	0,13	-52,44
G. Liming									
H. Urea application									
I. Other carbon-containing fertilizers									
J. Other	NO	NO	NO	NO	NO	NO	NO	NO	0,00
4. Land Use, Land-Use Change and Forestry	0,14	0,16	0,26	0,28	0,15	0,17	0,25	0,25	46,97
A. Forest land	0,05	0,06	0,16	0,17	0,05	0,05	0,13	0,13	-24,30
B. Cropland	0,06	0,06	0,06	0,07	0,07	0,07	0,07	0,07	100,00
C. Grassland	0,02	0,03	0,02	0,03	0,03	0,04	0,03	0,03	100,00
D. Wetlands	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	100,00
E. Settlements	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	NO, IE	0,00
F. Other land	NO	NO	NO	NO	NO	NO	NO	NO	0,00
G. Harvested wood products									
H. Other	NA	NA	NA	NA	NA	NA	NA	NA	0,00
5. Waste	14,25	14,49	14,81	15,61	16,42	17,42	18,41	19,51	298,18
A. Solid waste disposal									
B. Biological treatment of solid waste	0,03	0,04	0,03	0,02	0,02	0,02	0,02	0,02	-27,03
C. Incineration and open burning of waste	0,01	0,01	0,01	0,01	0,00	0,00	0,00	0,00	-97,45





GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	%								
D. Waste water treatment and discharge	14,20	14,44	14,77	15,59	16,39	17,39	18,39	19,49	303,08
E. Other	NO	NO	NO	NO	NO	NO	NO	NO	0,00
6. Other (as specified in the summary table in CRF)	NO	NO	NO	NO	NO	NO	NO	NO	0,00
Total direct N <sub>2</sub> O emissions without N <sub>2</sub> O from LULUCF	98,74	102,23	105,89	112,52	113,88	116,41	124,39	129,31	56,26
Total direct N <sub>2</sub> O emissions with N <sub>2</sub> O from LULUCF	98,89	102,39	106,15	112,80	114,03	116,57	124,64	129,56	56,24
Memo items:									
International bunkers	0,23	0,24	0,28	0,32	0,36	0,38	0,37	0,38	1.400,21
Aviation	0,16	0,19	0,21	0,24	0,28	0,31	0,30	0,31	1.896,15
Navigation	0,06	0,05	0,07	0,07	0,08	0,07	0,08	0,07	642,31
Multilateral operations	NO	NO	NO	NO	NO	NO	NO	NO	0,00
CO <sub>2</sub> emissions from biomass									
CO <sub>2</sub> captured									
Long-term storage of C in waste disposal sites									
Indirect N <sub>2</sub> O									
Indirect CO <sub>2</sub> (3)									

Abbreviations: CRF = common reporting format, LULUCF = land use, land-use change and forestry.

<sup>a</sup> The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the Conference of the Parties. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.

Table 1(d)  
**Emission trends (HFCs, PFCs and SF<sub>6</sub>)**  
 (Sheet 1 of 3)

**TUR\_BR4\_v0.2**

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
Emissions of HFCs and PFCs - (kt CO <sub>2</sub> equivalent)	625,30	625,30	863,34	722,59	403,08	710,00	611,44	577,15	574,01	615,00
Emissions of HFCs - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-23	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-32	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-41	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-43-10mee	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-125	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-134	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-134a	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-143	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-143a	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-152										
HFC-152a	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-161										
HFC-227ea	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-236cb										
HFC-236ea										
HFC-236fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	Base year <sup>a</sup>	1990	1991	1992	1993	1994	1995	1996	1997	1998
	kt									
HFC-245ca	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-245fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-365mfc	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Unspecified mix of HFCs(4) - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of PFCs - (kt CO <sub>2</sub> equivalent)	625,30	625,30	863,34	722,59	403,08	710,00	611,44	577,15	574,01	615,00
CF <sub>4</sub>	0,08	0,08	0,11	0,09	0,05	0,09	0,08	0,07	0,07	0,08
C <sub>2</sub> F <sub>6</sub>	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C <sub>3</sub> F <sub>8</sub>										
C <sub>4</sub> F <sub>10</sub>										
c-C <sub>4</sub> F <sub>8</sub>										
C <sub>5</sub> F <sub>12</sub>										
C <sub>6</sub> F <sub>14</sub>										
C <sub>10</sub> F <sub>18</sub>										
c-C <sub>3</sub> F <sub>6</sub>										
Unspecified mix of PFCs(4) - (kt CO <sub>2</sub> equivalent)										
Unspecified mix of HFCs and PFCs - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of SF <sub>6</sub> - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO	NO	10,05	11,10	11,90
SF <sub>6</sub>	NO	NO	NO	NO	NO	NO	NO	0,00	0,00	0,00
Emissions of NF <sub>3</sub> - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NF <sub>3</sub>	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Table 1(d)  
Emission trends (HFCs, PFCs and SF<sub>6</sub>)  
(Sheet 2 of 3)

TUR\_BR4\_v0.2

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	%										
Emissions of HFCs and PFCs - (kt CO <sub>2</sub> equivalent)	604,82	716,65	824,20	1.003,57	1.210,59	1.489,50	1.706,85	1.885,15	2.287,63	2.423,86	2.370,54
Emissions of HFCs - (kt CO <sub>2</sub> equivalent)	NO	115,66	232,00	417,19	628,80	909,37	1,146,88	1,424,19	1,713,19	1,896,14	2,111,28
HFC-23	NO	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
HFC-32	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-41	NO	NO	NO	NO	NO	NO	NO	NO	NO	0,00	0,00
HFC-43-10mee	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-125	NO	NO	NO	NO	NO	NO	NO	NO	NO	0,00	0,00
HFC-134	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-134a	NO	0,08	0,16	0,29	0,43	0,63	0,79	0,98	1,18	1,30	1,43
HFC-143	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0,00
HFC-143a	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-152											
HFC-152a	NO	0,00	0,00	0,00	0,01	0,01	0,01	0,02	0,02	0,04	0,18
HFC-161											
HFC-227ea	NO	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,01
HFC-236cb											
HFC-236ea											
HFC-236fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	0,00	0,00



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
	%										
HFC-245ca	NO	NO	NO	NO	NO	NO	NO	NO	NO	0,00	0,00
HFC-245fa	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HFC-365mfc	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	0,00
Unspecified mix of HFCs(4) - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of PFCs - (kt CO <sub>2</sub> equivalent)	604,82	601,00	592,20	586,39	581,79	580,13	559,96	460,96	574,44	527,72	259,26
CF <sub>4</sub>	0,08	0,08	0,07	0,07	0,07	0,07	0,07	0,06	0,07	0,07	0,03
C <sub>2</sub> F <sub>6</sub>	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
C <sub>3</sub> F <sub>8</sub>											
C <sub>4</sub> F <sub>10</sub>											
c-C <sub>4</sub> F <sub>8</sub>											
C <sub>5</sub> F <sub>12</sub>											
C <sub>6</sub> F <sub>14</sub>											
C <sub>10</sub> F <sub>18</sub>											
c-C <sub>3</sub> F <sub>6</sub>											
Unspecified mix of PFCs(4) - (kt CO <sub>2</sub> equivalent)											
Unspecified mix of HFCs and PFCs - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
Emissions of SF <sub>6</sub> - (kt CO <sub>2</sub> equivalent)	12,36	13,34	13,16	13,95	15,16	16,44	17,67	19,40	21,04	21,98	21,30
SF <sub>6</sub>	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00
Emissions of NF <sub>3</sub> - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
NF <sub>3</sub>	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO

Table 1(d)  
Emission trends (HFCs, PFCs and SF<sub>6</sub>)  
(Sheet 3 of 3)

TUR\_BR4\_v0.2

Source: Submission 2020 v1, TURKEY

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	%								
Emissions of HFCs and PFCs - (kt CO <sub>2</sub> equivalent)	3.516,02	3.913,01	4.615,90	4.740,85	5.033,87	4.795,95	6.257,59	8.121,84	1.198,88
Emissions of HFCs - (kt CO <sub>2</sub> equivalent)	3.054,28	3.432,64	4.256,83	4.470,24	4.778,45	4.636,96	6.116,92	8.048,73	100,00
HFC-23	0,00	0,00	0,01	0,00	0,00	0,00	0,00	0,00	100,00
HFC-32	NO	NO	0,00	0,00	0,00	0,00	1,63	4,29	100,00
HFC-41	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	100,00
HFC-43-10mee	NO	0,00	0,00	0,00	0,00	0,00	0,00	0,00	100,00
HFC-125	0,00	0,00	0,00	0,01	0,01	0,02	0,03	0,03	100,00
HFC-134	NO	0,00	0,00	0,00	0,00	0,00	0,00	0,00	100,00
HFC-134a	2,07	2,29	2,77	2,88	3,06	2,90	3,13	3,19	100,00
HFC-143	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	100,00
HFC-143a	NO	NO	0,00	0,00	0,00	0,00	0,00	0,00	100,00
HFC-152									
HFC-152a	0,33	0,64	0,85	1,11	1,14	1,27	1,38	1,47	100,00
HFC-161									
HFC-227ea	0,01	0,02	0,02	0,03	0,03	0,04	0,04	0,05	100,00
HFC-236cb									
HFC-236ea									
HFC-236fa	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,01	100,00
HFC-245ca	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	100,00
HFC-245fa	NO	NO	NO	NO, IE	0,01	0,01	0,01	NO, IE	0,00
HFC-365mfc	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	100,00
Unspecified mix of HFCs(4) - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO			



GREENHOUSE GAS SOURCE AND SINK CATEGORIES	2010	2011	2012	2013	2014	2015	2016	2017	Change from base to latest reported year
	%								
Emissions of PFCs - (kt CO <sub>2</sub> equivalent)	461,74	480,36	359,06	270,60	255,42	158,99	140,67	73,11	-88,31
CF <sub>4</sub>	0,06	0,06	0,05	0,03	0,03	0,02	0,01	0,00	-94,76
C <sub>2</sub> F <sub>6</sub>	0,00	0,00	0,00	0,00	0,00	0,00	0,01	0,00	0,29
C <sub>3</sub> F <sub>8</sub>									
C <sub>4</sub> F <sub>10</sub>									
c-C <sub>4</sub> F <sub>8</sub>									
C <sub>5</sub> F <sub>12</sub>									
C <sub>6</sub> F <sub>14</sub>									
C <sub>10</sub> F <sub>18</sub>									
c-C <sub>3</sub> F <sub>6</sub>									
Unspecified mix of PFCs(4) - (kt CO <sub>2</sub> equivalent)									
Unspecified mix of HFCs and PFCs - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	0,00
Emissions of SF <sub>6</sub> - (kt CO <sub>2</sub> equivalent)	23,39	25,28	26,49	26,92	32,78	39,74	36,52	73,12	100,00
SF <sub>6</sub>	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00	100,00
Emissions of NF <sub>3</sub> - (kt CO <sub>2</sub> equivalent)	NO	NO	NO	NO	NO	NO	NO	NO	0,00
NF <sub>3</sub>	NO	NO	NO	NO	NO	NO	NO	NO	0,00

Abbreviations: CRF = common reporting format, LULUCF = land use, land-use change and forestry.

<sup>a</sup> The column "Base year" should be filled in only by those Parties with economies in transition that use a base year different from 1990 in accordance with the relevant decisions of the Conference of the Parties. For these Parties, this different base year is used to calculate the percentage change in the final column of this table.

<sup>c</sup> Enter actual emissions estimates. If only potential emissions estimates are available, these should be reported in this table and an indication for this be provided in the documentation box. Only in these rows are the emissions expressed as CO<sub>2</sub> equivalent emissions.

<sup>d</sup> In accordance with the "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual inventories", HFC and PFC emissions should be reported for each relevant chemical. However, if it is not possible to report values for each chemical (i.e. mixtures, confidential data, lack of disaggregation), this row could be used for reporting aggregate figures for HFCs and PFCs, respectively. Note that the unit used for this row is kt of CO<sub>2</sub> equivalent and that appropriate notation keys should be entered in the cells for the individual chemicals.)

Table 2(a)

**Description of quantified economy-wide emission reduction target: base year<sup>a</sup>**

**TUR\_BR4\_v0.2**

Party	Turkey	
Base year /base period		
Emission reduction target	% of base year/base period	% of 1990 <sup>b</sup>
Period for reaching target	BY-2020	
<sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.		
<sup>b</sup> Optional.		







Table 2(b)

**Description of quantified economy-wide emission reduction target: gases and sectors covered<sup>a</sup>**

**TUR\_BR4\_v0.2**

Gases covered		Base year for each gas (year):
CO <sub>2</sub>		
CH <sub>4</sub>		
N <sub>2</sub> O		
HFCs		
PFCs		
SF <sub>6</sub>		
NF <sub>3</sub>		
Other Gases (specify)		
Sectors covered <sup>b</sup>	Energy	Yes
	Transport <sup>f</sup>	Yes
	Industrial processes <sup>g</sup>	Yes
	Agriculture	Yes
	LULUCF	Yes
	Waste	Yes
	Other Sectors (specify)	
<p>Abbreviations: LULUCF = land use, land-use change and forestry.</p> <p><sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.</p> <p><sup>b</sup> More than one selection will be allowed. If Parties use sectors other than those indicated above, the explanation of how these sectors relate to the sectors defined by the IPCC should be provided.</p> <p><sup>f</sup> Transport is reported as a subsector of the energy sector.</p> <p><sup>g</sup> Industrial processes refer to the industrial processes and solvent and other product use sectors.</p>		

Table 2(c)

**Description of quantified economy-wide emission reduction target: global warming potential values (GWP)<sup>a</sup>**

**TUR\_BR4\_v0.2**

Gases	GWP values <sup>b</sup>
CO <sub>2</sub>	
CH <sub>4</sub>	
N <sub>2</sub> O	
HFCs	
PFCs	
SF <sub>6</sub>	
NF <sub>3</sub>	
Other Gases (specify)	
Abbreviations: GWP = global warming potential	
<sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.	
<sup>b</sup> Please specify the reference for the GWP: Second Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) or the Fourth Assessment Report of the IPCC.	





Table 2(d)

**Description of quantified economy-wide emission reduction target: approach to counting emissions and removals from the LULUCF sector<sup>a</sup>**

**TUR\_BR4\_v0.2**

Role of LULUCF	LULUCF in base year level and target	Included
	Contribution of LULUCF is calculated using	

Abbreviation: LULUCF = land use, land-use change and forestry.

<sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

Table 2(e)

**Description of quantified economy-wide emission reduction target: market-based mechanisms under the Convention<sup>a</sup>**

**TUR\_BR4\_v0.2**

Market-based mechanisms under the Convention	Possible scale of contributions (estimated kt CO <sub>2</sub> eq)
CERs	
ERUs	
AAUs <sup>i</sup>	
Carry-over units <sup>j</sup>	

Other mechanism units under the Convention (specify)<sup>d</sup>

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction, ERU = emission reduction unit.

<sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

<sup>d</sup> As indicated in paragraph 5(e) of the guidelines contained in annex I of decision 2/CP.17 .

<sup>i</sup> AAUs issued to or purchased by a Party.

<sup>j</sup> Units carried over from the first to the second commitment periods of the Kyoto Protocol, as described in decision 13/CMP.1 and consistent with decision 1/CMP.8.

Table 2(e)II

**Description of quantified economy-wide emission reduction target: other market-based mechanisms<sup>a</sup>**

**TUR\_BR4\_v0.2**

Other market-based mechanisms	Possible scale of contributions
(Specify)	(estimated kt CO <sub>2</sub> eq)
<p><sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.</p>	

Table 2(f)

**Description of quantified economy-wide emission reduction target: any other information<sup>a,b</sup>**

**TUR\_BR4\_v0.2**

<p><sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.</p>
<p><sup>b</sup> This information could include information on the domestic legal status of the target or the total assigned amount of emission units for the period for reaching a target. Some of this information is presented in the narrative part of the biennial report.</p>



**Table 3**  
**Progress in achievement of the quantified economy-wide emission reduction target:**  
**information on mitigation actions and their effects**

Name of mitigation action <sup>a</sup>	Sector(s) affected <sup>b</sup>	GHG(s) affected	Objective and/or activity affected	Type of instrument <sup>c</sup>	Status of implementation <sup>d</sup>	Brief description <sup>e</sup>	Start year of implementation	Implementing entity or entities	Estimate of mitigation impact (not cumulative, in kt CO <sub>2</sub> eq)
									2020

Note: The two final columns specify the year identified by the Party for estimating impacts (based on the status of the measure and whether an ex post or ex ante estimation is available).

Abbreviations: GHG = greenhouse gas; LULUCF = land use, land-use change and forestry.

<sup>a</sup> Parties should use an asterisk (\*) to indicate that a mitigation action is included in the 'with measures' projection.

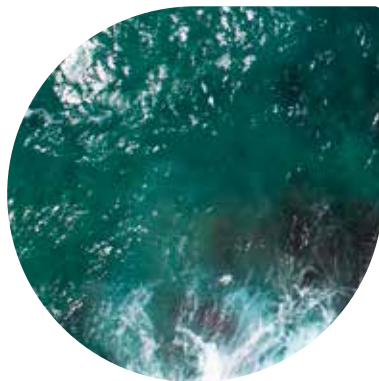
<sup>b</sup> To the extent possible, the following sectors should be used: energy, transport, industry/industrial processes, agriculture, forestry/LULUCF, waste management/waste, other sectors, cross-cutting, as appropriate.

<sup>c</sup> To the extent possible, the following types of instrument should be used: economic, fiscal, voluntary agreement, regulatory, information, education, research, other.

<sup>d</sup> To the extent possible, the following descriptive terms should be used to report on the status of implementation: implemented, adopted, planned.

<sup>e</sup> Additional information may be provided on the cost of the mitigation actions and the relevant timescale.

<sup>f</sup> Optional year or years deemed relevant by the Party.



**Table 4**  
**Reporting on progress<sup>a, b</sup>**

**TUR\_BR4\_v0.2**

Year <sup>c</sup>	Total emissions excluding LULUCF (kt CO <sub>2</sub> eq)	Contribution from LULUCF <sup>d</sup> (kt CO <sub>2</sub> eq)	Quantity of units from market based mechanisms under the Convention		Quantity of units from other market based mechanisms	
			(number of units)	(kt CO <sub>2</sub> eq)	(number of units)	(kt CO <sub>2</sub> eq)
Base year/ period						
2010						
2011						
2012						
2013						
2014						
2015						
2016						
2017						

Abbreviation: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

<sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

<sup>b</sup> For the base year, information reported on the emission reduction target shall include the following: (a) total GHG emissions, excluding emissions and removals from the LULUCF sector; (b) emissions and/or removals from the LULUCF sector based on the accounting approach applied taking into consideration any relevant decisions of the Conference of the Parties and the activities and/or land that will be accounted for; (c) total GHG emissions, including emissions and removals from the LULUCF sector. For each reported year, information reported on progress made towards the emission reduction targets shall include, in addition to the information noted in paragraphs 9(a–c) of the UNFCCC biennial reporting guidelines for developed country Parties, information on the use of units from market-based mechanisms

<sup>c</sup> Parties may add additional rows for years other than those specified below.

<sup>d</sup> Information in this column should be consistent with the information reported in table 4(a)I or 4(a)II, as appropriate. The Parties for which all relevant information on the LULUCF contribution is reported in table 1 of this common tabular format can refer to table 1.



**Table 4(a)  
Progress in achieving the quantified economy-wide emission reduction targets – further information on mitigation actions relevant to the contribution of the land use, land-use change and forestry sector in 2017 <sup>a,b</sup>**

**TUR\_BR4\_v0.2**

	Net GHG emissions/ removals from LULUCF categories <sup>c</sup>	Base year/ period or reference level value <sup>d</sup>	Contribution from LULUCF for reported year	Cumulative contribution from LULUCF <sup>e</sup>	Accounting approach <sup>f</sup>
	(kt CO <sub>2</sub> eq)				
Total LULUCF					
A. Forest land					
1. Forest land remaining forest land					
2. Land converted to forest land					
3. Other <sup>g</sup>					
B. Cropland					
1. Cropland remaining cropland					
2. Land converted to cropland					
3. Other <sup>g</sup>					
C. Grassland					
1. Grassland remaining grassland					
2. Land converted to grassland					
3. Other <sup>g</sup>					
D. Wetlands					
1. Wetland remaining wetland					
2. Land converted to wetland					
3. Other <sup>g</sup>					
E. Settlements					

1. Settlements remaining settlements					
2. Land converted to settlements					
3. Other <sup>g</sup>					
F. Other land					
1. Other land remaining other land					
2. Land converted to other land					
3. Other <sup>g</sup>					
G. Other					

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

<sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

<sup>b</sup> Parties that use the LULUCF approach that is based on table 1 do not need to complete this table, but should indicate the approach in table 2. Parties should fill in a separate table for each year, namely 2011 and 2012, where 2014 is the reporting year.

<sup>c</sup> For each category, enter the net emissions or removals reported in the most recent inventory submission for the corresponding inventory year. If a category differs from that used for the reporting under the Convention or its Kyoto Protocol, explain in the biennial report how the value was derived.

<sup>d</sup> Enter one reference level or base year/period value for each category. Explain in the biennial report how these values have been calculated.

<sup>e</sup> If applicable to the accounting approach chosen. Explain in this biennial report to which years or period the cumulative contribution refers to.

<sup>f</sup> Label each accounting approach and indicate where additional information is provided within this biennial report explaining how it was implemented, including all relevant accounting parameters (i.e. natural disturbances, caps).

<sup>g</sup> Specify what was used for the category "other". Explain in this biennial report how each was defined and how it relates to the categories used for reporting under the Convention or its Kyoto Protocol.





**Table 4(a)**  
**Progress in achieving the quantified economy-wide emission reduction targets – further information on mitigation actions relevant to the contribution of the land use, land-use change and forestry sector in 2018 <sup>a, b</sup>**

**TUR\_BR4\_v0.2**

	Net GHG emissions/removals from LULUCF categories <sup>c</sup>	Base year/ period or reference level value <sup>d</sup>	Contribution from LULUCF for reported year	Cumulative contribution from LULUCF <sup>e</sup>	Accounting approach <sup>f</sup>
	(kt CO <sub>2</sub> eq)				
Total LULUCF					
A. Forest land					
1. Forest land remaining forest land					
2. Land converted to forest land					
3. Other <sup>g</sup>					
B. Cropland					
1. Cropland remaining cropland					
2. Land converted to cropland					
3. Other <sup>g</sup>					
C. Grassland					
1. Grassland remaining grassland					
2. Land converted to grassland					
3. Other <sup>g</sup>					
D. Wetlands					
1. Wetland remaining wetland					
2. Land converted to wetland					
3. Other <sup>g</sup>					
E. Settlements					

1. Settlements remaining settlements					
2. Land converted to settlements					
3. Other <sup>g</sup>					
F. Other land					
1. Other land remaining other land					
2. Land converted to other land					
3. Other <sup>g</sup>					
G. Other					
Harvested wood products					

Abbreviations: GHG = greenhouse gas, LULUCF = land use, land-use change and forestry.

<sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

<sup>b</sup> Parties that use the LULUCF approach that is based on table 1 do not need to complete this table, but should indicate the approach in table 2. Parties should fill in a separate table for each year, namely 2011 and 2012, where 2014 is the reporting year.

<sup>c</sup> For each category, enter the net emissions or removals reported in the most recent inventory submission for the corresponding inventory year. If a category differs from that used for the reporting under the Convention or its Kyoto Protocol, explain in the biennial report how the value was derived.

<sup>d</sup> Enter one reference level or base year/period value for each category. Explain in the biennial report how these values have been calculated.

<sup>e</sup> If applicable to the accounting approach chosen. Explain in this biennial report to which years or period the cumulative contribution refers to.

<sup>f</sup> Label each accounting approach and indicate where additional information is provided within this biennial report explaining how it was implemented, including all relevant accounting parameters (i.e. natural disturbances, caps).

<sup>g</sup> Specify what was used for the category "other". Explain in this biennial report how each was defined and how it relates to the categories used for reporting under the Convention or its Kyoto Protocol



Table 4(b)  
Reporting on progress<sup>a, b, c</sup>

TUR\_BR4\_v0.2

Units of market based mechanisms		2017	Year	
			2018	
Kyoto Protocol units <sup>d</sup>	Kyoto Protocol units	(number of units)		
		(kt CO <sub>2</sub> eq)		
	AAUs	(number of units)		
		(kt CO <sub>2</sub> eq)		
	ERUs	(number of units)		
		(kt CO <sub>2</sub> eq)		
	CERs	(number of units)		
		(kt CO <sub>2</sub> eq)		
	tCERs	(number of units)		
		(kt CO <sub>2</sub> eq)		
	ICERs	(number of units)		
		(kt CO <sub>2</sub> eq)		
Other units <sup>d,e</sup>	Units from market-based mechanisms under the Convention	(number of units)		
		(kt CO <sub>2</sub> eq)		
	Units from other market-based mechanisms	(number of units)		
		(kt CO <sub>2</sub> eq)		
Total	(number of units)			
	(kt CO <sub>2</sub> eq)			

Abbreviations: AAUs = assigned amount units, CERs = certified emission reductions, ERUs = emission reduction units, ICERs = long-term certified emission reductions, tCERs = temporary certified emission reductions.

Note: 2011 is the latest reporting year.

<sup>a</sup> Reporting by a developed country Party on the information specified in the common tabular format does not prejudice the position of other Parties with regard to the treatment of units from market-based mechanisms under the Convention or other market-based mechanisms towards achievement of quantified economy-wide emission reduction targets.

<sup>b</sup> For each reported year, information reported on progress made towards the emission reduction target shall include, in addition to the information noted in paragraphs 9(a-c) of the reporting guidelines, on the use of units from market-based mechanisms.

<sup>c</sup> Parties may include this information, as appropriate and if relevant to their target.

<sup>d</sup> Units surrendered by that Party for that year that have not been previously surrendered by that or any other Party.

<sup>e</sup> Additional rows for each market-based mechanism should be added, if applicable.

**Table 5**  
**Summary of key variables and assumptions used in the projections analysis<sup>a</sup>**

**TUR\_BR4\_v0.2**

Key underlying assumptions		Historical <sup>b</sup>						Projected						
Assumption	Unit	1990	1995	2000	2005	2010	2012	2015	2016	2017	2018	2020	2025	2030
Population	thousands						75.627,00	78.151,00				82.076,00	85.569,00	88.427,00
Population growth	%						1,38	1,07				0,93	0,75	0,60
GDP growth rate	%						2,10	3,50				4,15	4,25	4,12

<sup>a</sup> Parties should include key underlying assumptions as appropriate.

<sup>b</sup> Parties should include historical data used to develop the greenhouse gas projections reported.

<sup>c</sup> Base year used in the projections is 2012. Key assumptions data given in the table for years 2012 and 2015 are the input data that has been utilized for the projections, therefore they are not updated. The GHG emission projection figures for years 2020 and 2030 are based on Turkey's INDC, which has been submitted on 30 September 2015. The projections have not been updated since then. The base year for the projections is 2012. However, the GHG emission trends for 1990-2015 have been updated based on Turkey's latest GHG Inventory. The emission projections are based on GHG emissions of year 2012 which are not revised.





**Table 7**  
**Provision of public financial support: summary information in 2017<sup>a</sup>**

**TUR\_BR4\_v0.2**

Allocation channels	Year									
	Turkish new lira - TRY					USD <sup>b</sup>				
	Core/ general <sup>c</sup> 1	Climate-specific <sup>d, 2</sup>				Core/ general <sup>c</sup> 1	Climate-specific <sup>d, 2</sup>			
		Mitigation	Adaptation	Cross-cutting <sup>e</sup>	Other <sup>f</sup>		Mitigation	Adaptation	Cross-cutting <sup>e</sup>	Other <sup>f</sup>
Total contributions through multilateral channels:										
Multilateral climate change funds <sup>g</sup>										
Other multilateral climate change funds <sup>h</sup>										
Multilateral financial institutions, including regional development banks										
Specialized United Nations bodies										
Total contributions through bilateral, regional and other channels										
<b>Total</b>										

Note: Explanation of numerical footnotes is provided in the documentation box after tables 7, 7(a) and 7(b).

Abbreviation: USD = United States dollars.

<sup>a</sup> Parties should fill in a separate table for each year, namely 2015 and 2016, where 2018 is the reporting year.

<sup>b</sup> Parties should provide an explanation of the methodology used for currency exchange for the information provided in tables 7, 7(a) and 7(b) in the documentation box.

<sup>c</sup> This refers to support to multilateral institutions that Parties cannot specify as being climate-specific.

<sup>d</sup> Parties should explain in their biennial reports how they define funds as being climate-specific.

<sup>e</sup> This refers to funding for activities that are cross-cutting across mitigation and adaptation.

<sup>f</sup> Please specify.

<sup>g</sup> Multilateral climate change funds listed in paragraph 17(a) of the "UNFCCC biennial reporting guidelines for developed country Parties" in decision 2/CP.17.

<sup>h</sup> Other multilateral climate change funds as referred in paragraph 17(b) of the "UNFCCC biennial reporting guidelines for developed country Parties" in decision 2/CP.17.

**Table 7**  
**Provision of public financial support: summary information in 2018<sup>a</sup>**

**TUR\_BR4\_v0.2**

Allocation channels	Year									
	Turkish new lira - TRY					USD <sup>b</sup>				
	Core/ general <sup>c</sup> 1	Climate-specific <sup>d,2</sup>				Core/ general <sup>c</sup> 1	Climate-specific <sup>d,2</sup>			
		Mitigation	Adaptation	Cross-cutting <sup>e</sup>	Other <sup>f</sup>		Mitigation	Adaptation	Cross-cutting <sup>e</sup>	Other <sup>f</sup>
Total contributions through multilateral channels:										
Multilateral climate change funds <sup>g</sup>										
Other multilateral climate change funds <sup>h</sup>										
Multilateral financial institutions, including regional development banks										
Specialized United Nations bodies										
Total contributions through bilateral, regional and other channels										
Total										

Note: Explanation of numerical footnotes is provided in the documentation box after tables 7, 7(a) and 7(b).

Abbreviation: USD = United States dollars.

<sup>a</sup> Parties should fill in a separate table for each year, namely 2015 and 2016, where 2018 is the reporting year.

<sup>b</sup> Parties should provide an explanation of the methodology used for currency exchange for the information provided in tables 7, 7(a) and 7(b) in the documentation box.

<sup>c</sup> This refers to support to multilateral institutions that Parties cannot specify as being climate-specific.

<sup>d</sup> Parties should explain in their biennial reports how they define funds as being climate-specific.



**Table 7(a)**  
**Provision of public financial support: contribution through multilateral channels in 2017<sup>a</sup>**

**TUR\_BR4\_v0.2**

Donor funding	Total amount				Status <sup>b</sup> <sub>3</sub>	Funding source <sup>f,4</sup>	Financial instrument <sup>f,5</sup>	Type of support <sup>f,6</sup> <sub>g,6</sub>	Sector <sup>c,f,7</sup>
	Core/general <sup>d,1</sup>		Climate-specific <sup>e,2</sup>						
	Turkish new lira - TRY	USD	Turkish new lira - TRY	USD					
Total contributions through multilateral channels									
Multilateral climate change funds									
1. Global Environment Facility									
2. Least Developed Countries Fund									
3. Special Climate Change Fund									
4. Adaptation Fund									
5. Green Climate Fund									
6. UNFCCC Trust Fund for Supplementary Activities									
7. Other multilateral climate change funds									
Multilateral financial institutions, including regional development banks									
1. World Bank									
2. International Finance Corporation									
3. African Development Bank									
4. Asian Development Bank									
5. European Bank for Reconstruction and Development									
6. Inter-American Development Bank									
7. Other									
Specialized United Nations bodies									
1. United Nations Development Programme									
2. United Nations Environment Programme									
3. Other									

Abbreviations: ODA = official development assistance, OOF = other official flows, USD = United States dollars.

<sup>a</sup> Parties should fill in a separate table for each year, namely 2015 and 2016, where 2018 is the reporting year.

<sup>b</sup> Parties should explain, in their biennial reports, the methodologies used to specify the funds as disbursed and committed. Parties will provide the information for as many status categories as appropriate in the following order of priority: disbursed and committed.

<sup>c</sup> Parties may select several applicable sectors. Parties may report sectoral distribution, as applicable, under "Other".

<sup>d</sup> This refers to support to multilateral institutions that Parties cannot specify as being climate-specific.

<sup>e</sup> Parties should explain in their biennial reports how they define funds as being climate-specific.

<sup>f</sup> Please specify.

<sup>g</sup> This refers to funding for activities that are cross-cutting across mitigation and adaptation.

Table 7(a)

Provision of public financial support: contribution through multilateral channels in 2018<sup>a</sup>

TUR\_BR4\_v0.2

Donor funding	Total amount				Status <sup>b,3</sup>	Funding source <sup>f,4</sup>	Financial instrument <sup>f,5</sup>	Type of support <sup>f,g,6</sup>	Sector <sup>c,f,7</sup>
	Core/general <sup>d,1</sup>		Climate-specific <sup>e,2</sup>						
	Turkish new lira - TRY	USD	Turkish new lira - TRY	USD					
Total contributions through multilateral channels									
Multilateral climate change funds									
1. Global Environment Facility									
2. Least Developed Countries Fund									
3. Special Climate Change Fund									
4. Adaptation Fund									
5. Green Climate Fund									
6. UNFCCC Trust Fund for Supplementary Activities									
7. Other multilateral climate change funds									
Multilateral financial institutions, including regional development banks									
1. World Bank									
2. International Finance Corporation									
3. African Development Bank									
4. Asian Development Bank									
5. European Bank for Reconstruction and Development									
6. Inter-American Development Bank									
7. Other									
Specialized United Nations bodies									
1. United Nations Development Programme									
2. United Nations Environment Programme									
3. Other									

Abbreviations: ODA = official development assistance, OOF = other official flows, USD = United States dollars.

<sup>a</sup> Parties should fill in a separate table for each year, namely 2015 and 2016, where 2018 is the reporting year.

<sup>b</sup> Parties should explain, in their biennial reports, the methodologies used to specify the funds as disbursed and committed. Parties will provide the information for as many status categories as appropriate in the following order of priority: disbursed and committed.

<sup>c</sup> Parties may select several applicable sectors. Parties may report sectoral distribution, as applicable, under "Other".

<sup>d</sup> This refers to support to multilateral institutions that Parties cannot specify as being climate-specific.

<sup>e</sup> Parties should explain in their biennial reports how they define funds as being climate-specific.

<sup>f</sup> Please specify.

<sup>g</sup> This refers to funding for activities that are cross-cutting across mitigation and adaptation.





**Table 7(b)**  
**Provision of public financial support: contribution through bilateral, regional and other channels in 2017<sup>a</sup>**

**TUR\_BR4\_v0.2**

Recipient country/ region/project/ programme <sup>b</sup>	Total amount		Status <sup>c, 3</sup>	Funding source <sup>g, 4</sup>	Financial instrument <sup>g, 5</sup>	Type of support <sup>g, h, 6</sup>	Sector <sup>d, 7</sup>	Additional information <sup>e</sup>
	Climate-specific <sup>f, 2</sup>							
	Turkish new lira - TRY	USD						
Total contributions through bilateral, regional and other channels								

Abbreviations: ODA = official development assistance, OOF = other official flows; USD = United States dollars.

<sup>a</sup> Parties should fill in a separate table for each year, namely 2015 and 2016, where 2018 is the reporting year.

<sup>b</sup> Parties should report, to the extent possible, on details contained in this table.

<sup>c</sup> Parties should explain, in their biennial reports, the methodologies used to specify the funds as disbursed and committed. Parties will provide the information for as many status categories as appropriate in the following order of priority: disbursed and committed.

<sup>d</sup> Parties may select several applicable sectors. Parties may report sectoral distribution, as applicable, under "Other".

<sup>e</sup> Parties should report, as appropriate, on project details and the implementing agency.

<sup>f</sup> Parties should explain in their biennial reports how they define funds as being climate-specific.

<sup>g</sup> Please specify.

<sup>h</sup> This refers to funding for activities that are cross-cutting across mitigation and adaptation.

Table 7(b)

**Provision of public financial support: contribution through bilateral, regional and other channels in 2018<sup>a</sup>**

**TUR\_BR4\_v0.2**

Recipient country/ region/project/ programme <sup>b</sup>	Total amount		Status <sup>c, 3</sup>	Funding source <sup>9, 4</sup>	Financial instrument <sup>9, 5</sup>	Type of support <sup>9, h, 6</sup>	Sector <sup>d, 9, 7</sup>	Additional information <sup>e</sup>
	Climate-specific <sup>f, 2</sup>							
	Turkish new lira - TRY	USD						
Total contributions through bilateral, regional and other channels								

Abbreviations: ODA = official development assistance, OOF = other official flows; USD = United States dollars.

<sup>a</sup> Parties should fill in a separate table for each year, namely 2015 and 2016, where 2018 is the reporting year.

<sup>b</sup> Parties should report, to the extent possible, on details contained in this table.

<sup>c</sup> Parties should explain, in their biennial reports, the methodologies used to specify the funds as disbursed and committed. Parties will provide the information for as many status categories as appropriate in the following order of priority: disbursed and committed.

<sup>d</sup> Parties may select several applicable sectors. Parties may report sectoral distribution, as applicable, under "Other".

<sup>e</sup> Parties should report, as appropriate, on project details and the implementing agency.

<sup>f</sup> Parties should explain in their biennial reports how they define funds as being climate-specific.

<sup>9</sup> Please specify.

<sup>h</sup> This refers to funding for activities that are cross-cutting across mitigation and adaptation.



**Table 8**  
**Provision of technology development and transfer support<sup>a,b</sup>**

**TUR\_BR4\_v0.2**

Recipient country and/or region	Targeted area	Measures and activities related to technology transfer	Sector <sup>c</sup>	Source of the funding for technology transfer	Activities undertaken by	Status	Additional information <sup>d</sup>

<sup>a</sup> To be reported to the extent possible.

<sup>b</sup> The tables should include measures and activities since the last national communication or biennial report.

<sup>c</sup> Parties may report sectoral disaggregation, as appropriate.

<sup>d</sup> Additional information may include, for example, funding for technology development and transfer provided, a short description of the measure or activity and co-financing arrangements.

**Table 9**  
**Provision of capacity-building support<sup>a</sup>**

**TUR\_BR4\_v0.2**

Recipient country/region	Targeted area	Programme or project title	Description of programme or project <sup>b,c</sup>

<sup>a</sup> To be reported to the extent possible.

<sup>b</sup> Each Party included in Annex II to the Convention shall provide information, to the extent possible, on how it has provided capacity-building support that responds to the existing and emerging capacity-building needs identified by Parties not included in Annex I to the Convention in the areas of mitigation, adaptation and technology development and transfer.

<sup>c</sup> Additional information may be provided on, for example, the measure or activity and co-financing arrangements.

## Annex II : 2017 National Energy Balance Table<sup>22</sup> (Thousand TEP)

ENERGY SUPPLY DISTRIBUTION	Coal	Lignite	As-phal-tite	Cok-ing Coal	Deriv-ative Gases	Coal Tar	Crude Oil	Petro-leum Prod-ucts	Natural Gas	Bioen-ergy and Wastes	Hy-draulic	Wind	Electric	Other Heat	Geo-thermal	Solar	TOTAL
Domestic Production (+)	723	13.752	611				2.681		292	2.531	5.007	1.540			7.128	1.091	35.357
Importation (+)	24.347			537		1	27.055	26.668	45.581				235				124.425
Exportation (-)	60			2		110		6.876	520				284				7.853
Bunker (-)								4.575									4.575
Inventory Variation (+/-)	-304	39	-55	-31		11	-245	-431	-1.034								-2.050
SUPPLY OF ENERGY PRODUCTS	24.707	13.791	555	504	0	-98	29.491	14.786	44.319	2.531	5.007	1.540	-49	0	7.128	1.091	145.305
--Statistical Difference (+/-)--	126	-3	-6	-127	0	13	0	222	65	-1	0	0	0	0	0	0	289
CYCLE AND ENERGY SECTOR	-15.823	-10.734	-551	2.780	407	137	-29.491	28.352	-19.887	-367	-5.007	-1.540	21.306	2.281	-5.268	-248	-33.654
Electricity and Heat Generation <sup>4</sup>	-11.141	-10.462	-551		-868			-373	-18.057	-342	-5.007	-1.540	25.566	1.034	-5.268	-248	-27.258
Heat Generation <sup>6</sup>	-221	-262			-99			-136	-880	-25				1.663			40
Coke Ovens	-4.276			2.780	832	137											-526
Blast Furnace					1.457												1.457
Petroleum Refineries							-29.354	33.163	-630				-159	-417			2.603
Internal Consumption and Loss	-185	-9			-916		-138	-4.301	-320				-4.100				-9.970



TOTAL FINAL ENERGY CONSUMPTION	8.883	3.057	5	3.284	407	40	0	43.139	24.432	2.165	0	0	21.257	2.281	1.860	843	111.650
TOTAL SECTORS	8.757	3.060	11	3.411	407	26	0	42.916	24.367	2.166	0	0	21.257	2.280	1.860	843	111.362
INDUSTRY CONSUMPTION	3.974	1.765	0	3.411	407	26	0	4.293	9.043	0	0	0	9.858	2.246	0	295	35.318
Mining Activities (07,08,09)	2	89						157	119				121	4			491
Food, Beverage, Tobacco Manufacturing (10,11,12)	179	336		46				29	1.020				644	462			2.715
Textile, Leather Products Manufacturing (13,14,15)	130	567						11	936				1.464	84			3.192
Wood and Products Manufacturing (16)	5	5						5	161				200	64			441
Manufacture of Paper and Paper Products (17,18)	20	81						7	203				302	156			768
Chemical, Petrochemical Products Manufacturing (20,21,22)	115	109		9				9	1.832				1.071	225			3.371
40/5000 Manufacture of Non-Metallic Mineral Products (23)	2.273	551		15	3			3.795	1.778				1.114	45			9.574
Basic Metal Industry (24,25)	1.250	22		3.341	404	26		23	1.787				2.721	160			9.733
Machinery, Electrical, Electronic Products Manufacturing (26,27,28)		0						8	60				248	7			323
Transportation Vehicles Manufacturing (29,30)		6						14	144				227	6			396

Furniture manufacturing (31)	0							1	39				73				113
Build (41,42,43)	0	0						81	504				320	1			906
Other Industry	0	0		0				153	458				1.355	1.034		295	3.295
TRANSPORTATION	0	0	0	0	0	0	0	27.757	436	125	0	0	111	0	0	0	28.429
Railways								122					85				207
Maritime								393					0				393
Airways								1.272					0				1.272
Pipelines									367				27				393
Highways								25.970	69	125			0				26.164
OTHER SECTORS	4.784	1.295	11	0	0	0	0	4.061	14.321	2.041	0	0	11.287	34	1.860	548	40.242
Housing	2.444	955	11					245	11.150	2.041			4.666		777	548	22.836
Trade and Services	2.340	340						880	3.074				6.037	34	475		13.179
Agriculture and Livestock								2.936	97				585		609		4.227
NON-ENERGY CONSUMPTION	0	0	0	0	0	0	0	6.804	568	0	0	0	0	0	0	0	7.372
Petro Chemistry Feedstock								2.179									2.179



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