

## EXECUTIVE SUMMARY

### ES.1 Background information on greenhouse gas (GHG) inventories and climate change

#### ES.1.1 Background information on climate change

Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. It undergoes natural variability. Since industrialisation started some 150 years ago, mankind has been influencing the climate via the emission of greenhouse gases. In 1992, by adopting the United Nations Convention on Climate Change, the countries of the world came together to prevent harmful effects of climate change. However, the Convention did not include binding commitments to limit GHG emissions. To go this step further the Kyoto Protocol was adopted in 1997: It sets binding emission limits for 37 industrialized countries for the period 2008–2012.

An agreement on a second Kyoto commitment period from 2013 to 2020 was achieved 2012 at the 18<sup>th</sup> Conference of the Parties in Doha (Qatar) (UNFCCC CMP.8 ). The agreed reduction for the EU is 20% compared to 1990 emissions, which is in line with the climate and energy package 2020 of the EU.

#### ES.1.2 Background information on greenhouse gas inventories

To be able to evaluate the trend of greenhouse gas emissions, especially the progress in achieving the emission reduction goal, it is necessary to regularly compile an inventory of GHG emissions. The compilation of these inventories follows rules as agreed under the respective bodies of the UNFCCC and the Kyoto Protocol.

### ES.2 Summary of national emission and removal-related trends

In 2016 Austria's total greenhouse gas (GHG) emissions (without LULUCF) amounted to 79.7 Mt CO<sub>2</sub> equivalents (CO<sub>2</sub>e). Compared to 1990 GHG emissions increased by 1.2%, compared to 2015 GHG emissions increased by 1.0%.

The most important GHG in Austria is carbon dioxide (CO<sub>2</sub>) with a share of 85% in 2016. The CO<sub>2</sub> emissions primarily result from combustion activities. Methane (CH<sub>4</sub>), which mainly arises from stock farming and waste disposal, contributes 8.2% to national total GHG emissions, and nitrous oxide (N<sub>2</sub>O) with agricultural soils as the main source contributes another 4.5% in 2016. The remaining 2.6% are emissions of fluorinated compounds, which are mostly emitted from the use of these gases as substitutes for ozone depleting substances (ODS) in refrigeration equipment.

Table 1: Austria's greenhouse gas emissions by gas.

GHG	Total	CO <sub>2</sub>	CH <sub>4</sub>	N <sub>2</sub> O	HFCs	PFCs	SF <sub>6</sub>	NF <sub>3</sub>
1990	78 690	62 292	10 405	4 337	2.4	1 183	471	0
1991	82 496	65 900	10 284	4 501	3.9	1 193	614	0
1992	75 796	60 431	10 000	4 192	5.6	510	656	0
1993	75 855	60 788	9 915	4 109	235	64	744	0
1994	76 393	61 190	9 628	4 316	261	71	926	1
1995	79 730	64 206	9 561	4 420	353	83	1 100	6
1996	82 924	67 674	9 257	4 311	417	80	1 177	8
1997	82 461	67 453	8 955	4 336	498	117	1 086	16
1998	81 757	67 054	8 776	4 383	609	56	870	9
1999	80 055	65 621	8 597	4 372	701	79	676	8
2000	80 432	66 262	8 434	4 349	714	88	575	11
2001	84 510	70 391	8 274	4 226	863	116	629	11
2002	86 199	72 147	8 130	4 227	969	102	613	11
2003	91 817	77 764	8 067	4 216	1 072	126	549	22
2004	91 575	78 053	8 068	3 628	1 158	158	484	27
2005	92 655	79 367	7 830	3 627	1 146	163	494	28
2006	89 832	76 688	7 705	3 628	1 152	172	453	33
2007	87 103	74 032	7 579	3 638	1 196	230	367	59
2008	86 951	73 806	7 446	3 815	1 249	208	373	53
2009	80 119	67 483	7 354	3 590	1 309	36	342	5
2010	84 931	72 383	7 255	3 391	1 483	78	336	4
2011	82 450	70 116	7 053	3 490	1 407	74	307	4
2012	79 917	67 661	6 943	3 456	1 486	51	312	9
2013	80 178	68 001	6 851	3 451	1 512	49	305	10
2014	76 442	64 253	6 709	3 520	1 583	53	313	11
2015	78 856	66 704	6 632	3 527	1 620	50	310	13
2016	79 673	67 402	6 567	3 614	1 641	50	393	6

NOTE: Emissions without LULUCF

Over the period 1990–2016 CO<sub>2</sub> emissions increased by 8.2%, mainly due to increased emissions from transport. Methane emissions decreased during the same period by 37% mainly due to lower emissions from solid waste disposal; N<sub>2</sub>O emissions decreased by 17% over the same period due to lower emissions from agricultural soils and from chemical industry. HFC emissions increased remarkably between 1990 and 2016 (from 2.4 to 1 641 kt CO<sub>2</sub>e), whereas PFC and SF<sub>6</sub> emissions decreased by 96% and 17% respectively. NF<sub>3</sub> emissions amounted to 6.1 kt CO<sub>2</sub> equivalents in 2016 compared to zero emissions in 1990.

### ES.3 Overview of source and sink category emission estimates and trends

The dominant sector regarding GHG emissions in Austria is *Energy*, causing 68% of total national GHG emissions in 2016 (67% in 1990), followed by the sectors *Industrial Processes and Other Product Use* (21% in 2016) and *Agriculture* (9.1% in 2016).

Table 2: Austria's greenhouse gas emissions by sector.

GHG source and sink categories	1.	2.	3.	4. LULUCF	5.	6.
	Energy	IPPU	Agriculture		Waste	Other
CO <sub>2</sub> equivalents (kt)						
1990	52 914	13 662	8 189	-11 982	3 925	NO*
1991	56 581	13 696	8 225	-16 685	3 994	NO
1992	52 009	12 053	7 787	-11 663	3 946	NO
1993	52 272	12 004	7 658	-11 962	3 921	NO
1994	51 932	12 739	7 899	-11 839	3 823	NO
1995	54 436	13 605	8 038	-13 261	3 651	NO
1996	58 615	13 057	7 789	-10 644	3 463	NO
1997	57 187	14 219	7 740	-19 124	3 315	NO
1998	56 989	13 865	7 708	-17 222	3 195	NO
1999	55 731	13 647	7 601	-19 497	3 075	NO
2000	55 322	14 640	7 506	-16 364	2 963	NO
2001	59 675	14 521	7 449	-19 202	2 865	NO
2002	60 835	15 164	7 337	-14 166	2 863	NO
2003	66 457	15 305	7 189	-4 789	2 867	NO
2004	66 614	14 861	7 170	-9 118	2 930	NO
2005	67 150	15 610	7 104	-10 597	2 791	NO
2006	63 834	16 249	7 077	-5 116	2 671	NO
2007	60 503	16 938	7 119	-5 510	2 543	NO
2008	60 023	17 271	7 226	-4 276	2 431	NO
2009	56 642	13 947	7 245	-4 544	2 285	NO
2010	59 752	15 926	7 095	-5 878	2 158	NO
2011	57 306	15 955	7 146	-6 106	2 043	NO
2012	55 325	15 570	7 079	-5 476	1 942	NO
2013	55 400	15 887	7 063	-4 524	1 829	NO
2014	51 440	16 073	7 189	-4 725	1 739	NO
2015	53 352	16 669	7 178	-4 445	1 656	NO
2016	54 336	16 468	7 286	-4 208	1 581	NO

\* not occurring

## ES.4 Other information

### Overview of Emission Estimates and Trends of Indirect GHGs and SO<sub>2</sub>

Emissions of indirect greenhouse gases decreased in the period from 1990 to 2016: NO<sub>x</sub> by 31%, CO by 53%, NMVOC by 55%, and SO<sub>2</sub> by 81%. The most important emission source for NO<sub>x</sub>, SO<sub>2</sub> and CO is *Energy* (fuel combustion). The most important emission source for NMVOC is *Solvent and other Product Use*.

Table 3: Emissions of indirect GHGs and SO<sub>2</sub> 1990–2016.

Year	NO <sub>x</sub>	CO	NMVOC	SO <sub>2</sub>
1990	219	1.190	302	74
1991	228	1.186	295	71
1992	215	1.132	272	54
1993	206	1.077	254	53
1994	200	1.022	232	47
1995	200	928	218	47
1996	218	937	212	44
1997	204	877	200	40
1998	217	841	193	36
1999	208	736	184	34
2000	214	740	175	32
2001	224	719	172	33
2002	230	693	169	32
2003	238	700	167	31
2004	235	690	162	27
2005	238	670	159	26
2006	225	657	154	26
2007	214	619	149	23
2008	199	600	146	20
2009	183	570	142	15
2010	183	582	143	16
2011	174	568	139	15
2012	169	571	139	15
2013	170	590	140	15
2014	160	543	135	15
2015	157	566	137	15
2016	152	563	137	14