

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 dangerous 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 18th 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 2014 Austria's total greenhouse gas (GHG) emissions (without LULUCF) amounted to 76.3 Mt CO₂ equivalents (CO₂e). Compared to 1990 GHG emissions decreased by 3.2%, compared to 2013 GHG emissions decreased by 4.6%.

The most important GHG in Austria is carbon dioxide (CO₂) with a share of 84% in 2014. The CO₂ emissions primarily result from combustion activities. Methane (CH₄), which mainly arises from stock farming and waste disposal, contributes 8.7% to national total GHG emissions, and nitrous oxide (N₂O) with agricultural soils as the main source contributes another 4.5% in 2014. 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 ₂ | CH ₄ | N ₂ O | HFCs | PFCs | SF ₆ | NF ₃ |
|---------------------------------|---------------|-----------------|-----------------|------------------|-------|-------|-----------------|-----------------|
| CO ₂ equivalent (kt) | | | | | | | | |
| 1990 | 78 845 | 62 297 | 10 599 | 4 293 | 2 | 1 183 | 471 | 0 |
| 1991 | 82 637 | 65 904 | 10 462 | 4 461 | 4 | 1 193 | 614 | 0 |
| 1992 | 75 931 | 60 432 | 10 165 | 4 162 | 6 | 510 | 656 | 0 |
| 1993 | 75 988 | 60 791 | 10 074 | 4 081 | 235 | 64 | 744 | 0 |
| 1994 | 76 503 | 61 189 | 9 776 | 4 280 | 261 | 71 | 926 | 1 |
| 1995 | 79 813 | 64 202 | 9 674 | 4 389 | 358 | 83 | 1 100 | 6 |
| 1996 | 83 009 | 67 667 | 9 383 | 4 273 | 421 | 80 | 1 177 | 8 |
| 1997 | 82 474 | 67 456 | 9 012 | 4 287 | 501 | 117 | 1 086 | 16 |
| 1998 | 81 771 | 67 047 | 8 831 | 4 347 | 610 | 56 | 870 | 9 |
| 1999 | 80 107 | 65 660 | 8 645 | 4 336 | 702 | 79 | 676 | 8 |
| 2000 | 80 429 | 66 275 | 8 466 | 4 302 | 714 | 88 | 575 | 11 |
| 2001 | 84 381 | 70 299 | 8 284 | 4 178 | 863 | 116 | 629 | 11 |
| 2002 | 86 130 | 72 127 | 8 134 | 4 174 | 969 | 102 | 613 | 11 |
| 2003 | 92 018 | 78 024 | 8 061 | 4 164 | 1 072 | 126 | 549 | 22 |
| 2004 | 91 836 | 78 389 | 8 049 | 3 572 | 1 158 | 158 | 484 | 27 |
| 2005 | 92 810 | 79 589 | 7 810 | 3 581 | 1 146 | 163 | 494 | 28 |
| 2006 | 89 981 | 76 935 | 7 668 | 3 567 | 1 152 | 172 | 453 | 33 |
| 2007 | 87 241 | 74 268 | 7 543 | 3 577 | 1 196 | 230 | 367 | 59 |
| 2008 | 87 101 | 74 066 | 7 399 | 3 752 | 1 249 | 208 | 373 | 53 |
| 2009 | 80 191 | 67 683 | 7 294 | 3 523 | 1 308 | 36 | 342 | 5 |
| 2010 | 84 946 | 72 532 | 7 183 | 3 330 | 1 483 | 78 | 336 | 4 |
| 2011 | 82 627 | 70 327 | 6 976 | 3 402 | 1 536 | 74 | 307 | 4 |
| 2012 | 79 897 | 67 699 | 6 855 | 3 360 | 1 612 | 51 | 312 | 9 |
| 2013 | 80 043 | 67 957 | 6 757 | 3 361 | 1 603 | 49 | 305 | 10 |
| 2014 | 76 333 | 64 263 | 6 623 | 3 427 | 1 643 | 53 | 313 | 11 |

NOTE: Emissions without LULUCF

Over the period 1990–2014 CO₂ emissions increased by 3.2%, mainly due to increased emissions from transport. Methane emissions decreased during the same period by 38% mainly due to lower emissions from solid waste disposal; N₂O emissions decreased by 20% over the same period due to lower emissions from agricultural soils and from chemical industry. HFC emissions increased remarkably between 1990 and 2014 (from 2.4 to 1.6432 kt CO₂e), whereas PFC and SF₆ emissions decreased by 96% and 33% respectively. NF₃ emissions amounted to 11 kt in 2014 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 67% of total national GHG emissions in 2014 (67% in 1990), followed by the sectors *Industrial Processes and Other Product Use* (21% in 2014) and *Agriculture* (9.2% in 2014).

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

| GHG source and sink categories | 1. | 2. | 3. | 4. | 5. | 6. |
|----------------------------------|--------|--------|-------------|---------|-------|-------|
| | Energy | IPPU | Agriculture | LULUCF | Waste | Other |
| CO ₂ equivalents (kt) | | | | | | |
| 1990 | 52 917 | 13 663 | 8 104 | -12 853 | 4 160 | NO |
| 1991 | 56 603 | 13 696 | 8 130 | -17 488 | 4 207 | NO |
| 1992 | 52 027 | 12 054 | 7 710 | -12 541 | 4 140 | NO |
| 1993 | 52 318 | 12 005 | 7 569 | -12 901 | 4 096 | NO |
| 1994 | 51 966 | 12 739 | 7 816 | -12 819 | 3 982 | NO |
| 1995 | 54 447 | 13 610 | 7 960 | -14 110 | 3 795 | NO |
| 1996 | 58 645 | 13 061 | 7 710 | -11 554 | 3 593 | NO |
| 1997 | 57 162 | 14 223 | 7 657 | -19 927 | 3 433 | NO |
| 1998 | 56 973 | 13 867 | 7 629 | -18 058 | 3 302 | NO |
| 1999 | 55 764 | 13 648 | 7 523 | -20 184 | 3 172 | NO |
| 2000 | 55 313 | 14 642 | 7 424 | -16 918 | 3 051 | NO |
| 2001 | 59 544 | 14 524 | 7 368 | -19 845 | 2 945 | NO |
| 2002 | 60 774 | 15 166 | 7 254 | -14 987 | 2 935 | NO |
| 2003 | 66 670 | 15 308 | 7 109 | -5 521 | 2 932 | NO |
| 2004 | 66 898 | 14 864 | 7 086 | -9 929 | 2 989 | NO |
| 2005 | 67 336 | 15 613 | 7 017 | -11 378 | 2 845 | NO |
| 2006 | 64 021 | 16 252 | 6 988 | -6 080 | 2 720 | NO |
| 2007 | 60 688 | 16 941 | 7 025 | -6 504 | 2 587 | NO |
| 2008 | 60 233 | 17 274 | 7 123 | -5 281 | 2 471 | NO |
| 2009 | 56 777 | 13 948 | 7 145 | -5 080 | 2 321 | NO |
| 2010 | 59 833 | 15 926 | 6 996 | -6 525 | 2 191 | NO |
| 2011 | 57 434 | 16 084 | 7 036 | -6 934 | 2 072 | NO |
| 2012 | 55 266 | 15 697 | 6 965 | -6 351 | 1 969 | NO |
| 2013 | 55 248 | 15 981 | 6 959 | -5 201 | 1 855 | NO |
| 2014 | 51 418 | 16 076 | 7 074 | -5 558 | 1 765 | NO |

ES.4 Other information

Overview of Emission Estimates and Trends of Indirect GHGs and SO₂

Emissions of indirect greenhouse gases decreased in the period from 1990 to 2014: NO_x by 30%, CO by 58%, NMVOC by 61%, and SO₂ by 79%. The most important emission source for NO_x, SO₂ 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 SO₂ 1990–2014.

| Year | NO _x | CO | NMVOC | SO ₂ |
|------|-----------------|-------|-------|-----------------|
| | [kt] | | | |
| 1990 | 215 | 1 285 | 280 | 74 |
| 1991 | 223 | 1 285 | 276 | 71 |
| 1992 | 210 | 1 215 | 255 | 55 |
| 1993 | 201 | 1 149 | 240 | 53 |

| Year | NO _x | CO | NM VOC | SO ₂ |
|------|-----------------|-------|--------|-----------------|
| | | [kt] | | |
| 1994 | 194 | 1 084 | 218 | 48 |
| 1995 | 193 | 986 | 204 | 47 |
| 1996 | 211 | 991 | 198 | 45 |
| 1997 | 200 | 922 | 177 | 40 |
| 1998 | 212 | 885 | 169 | 36 |
| 1999 | 204 | 782 | 161 | 34 |
| 2000 | 209 | 784 | 153 | 31 |
| 2001 | 219 | 759 | 149 | 33 |
| 2002 | 224 | 726 | 146 | 32 |
| 2003 | 234 | 730 | 143 | 32 |
| 2004 | 231 | 711 | 139 | 27 |
| 2005 | 233 | 684 | 136 | 26 |
| 2006 | 219 | 662 | 130 | 27 |
| 2007 | 210 | 629 | 126 | 24 |
| 2008 | 193 | 608 | 124 | 22 |
| 2009 | 177 | 566 | 118 | 16 |
| 2010 | 177 | 578 | 118 | 18 |
| 2011 | 167 | 561 | 114 | 17 |
| 2012 | 161 | 561 | 113 | 16 |
| 2013 | 160 | 580 | 115 | 16 |
| 2014 | 149 | 535 | 110 | 16 |