ENVIRONMENT AGENCY AUSTRIA umweltbundesamt

Austria's Annual Greenhouse Gas Inventory 1990–2011

Submission under Decision 280/2004/EC

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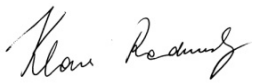
Date 15.01.2013	Responsible for the content of this report  Dr. Klaus Radunsky (Head of the inspection body)
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VORWORT

Dieser Bericht

Der vorliegende Bericht präsentiert die neuesten Daten der Treibhausgas- (THG-) Emissionen Österreichs. Diese Daten betreffen die Emissionen des Jahres 2011 sowie die aktualisierte Zeitreihe der Jahre 1990 bis 2010.

Er folgt in Format und Inhalt den verbindlichen Anforderungen des THG-Überwachungssystems 280/2004/EG[1] der EU zur Umsetzung des Kyoto-Protokolls. Dieses System umfasst die jährliche Übermittlung von aktualisierten THG-Emissionsdaten und einem dazugehörigen Kurzbericht („Short-NIR“) mit 15. Jänner an die Europäische Kommission[2]. Eine detaillierte Darstellung der Daten wird der Europäischen Kommission in digitaler Form übermittelt.

Rechtlicher Hintergrund

Als Vertragsstaat der Klimarahmenkonvention (*Rahmenübereinkommens der Vereinten Nationen über Klimaänderungen* (UN Framework Convention on Climate Change – UNFCCC, BGBl. Nr. 414/1994)) ist Österreich verpflichtet, jährlich seine Emissionen und Senken bezüglich der direkten Treibhausgase CO_2, CH_4, N_2O, HFC, PFC und SF_6, sowie der indirekten Treibhausgase NO_x, NMVOC, CO und SO_2 zu erheben und zu berichten. Die dafür anzuwendende Methodik ist in einem umfassenden Regelwerk entsprechend den Beschlüssen der Vertragsstaatenkonferenz der UNFCCC festgelegt.

Auch die Europäische Union (EU) ist Vertragsstaat der Klimarahmenkonvention. Die EU Inventur wird aus der Summe der Mitgliedsstaaten-Inventuren errechnet. Deshalb hat die EU mit dem o. g. THG Überwachungssystem die Anforderungen, die an die EU gestellt werden an die Mitgliedsstaaten weitergegeben und diese dazu verpflichtet, Daten und Informationen, die für die Erstellung der EU Inventur benötigt werden, rechtzeitig zur Verfügung zu stellen. Mit dem vorliegenden Bericht kommt Österreich dieser Berichtspflicht nach.

Die Erhebung der Daten berücksichtigt außerdem die Ergebnisse der jährlichen Überprüfung durch die UNFCCC im Rahmen der so genannten UNFCCC-Tiefenprüfung. Im September 2012 fand die letzte dieser Tiefenprüfungen der Österreichischen Treibhausgas-Inventur durch internationale Fachexperten statt. Die Ergebnisse dieser Prüfung werden im Frühjahr 2013 veröffentlicht werden. Die im Rahmen der Inventurprüfung eingebrachten Verbesserungsvorschläge wurden teilweise bereits in der diesjährigen Inventur berücksichtigt, teilweise fließen sie in das Inventurverbesserungsprogramm 2013 ein (siehe Tabelle A).

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[1] Entscheidung Nr. 280/2004/EG des Europäischen Parlaments und des Rates vom 11. Februar 2004 über ein System zur Überwachung der Treibhausgasemissionen in der Gemeinschaft und zur Umsetzung des Kyoto-Protokolls.

[2] Der vorliegende Bericht beinhaltet die folgenden Elemente des THG-Überwachungssystems 280/2004/EG: Zusammenfassung des Nationalen Inventur-Berichtes im Sinne des Artikels 3 (1) f; Artikel 3 (1) i: methodische Verbesserungen („Recalculations“); Artikel 3 (1) j: Indikatoren; Artikel 3 (1) k: Informationen zu Änderungen des Nationalen Inventursystems; Artikel 3 (1) g: Informationen des Registers; und Artikel 3 (1) h: Informationen über juristische Personen, die befugt sind, sich an den Mechanismen nach den Artikeln 6, 12 und 17 des Kyoto-Protokolls unter Beachtung der einschlägigen nationalen oder gemeinschaftlichen Bestimmungen zu beteiligen.

Tabelle A: Jährlicher Prozess zur Erstellung und Überarbeitung der THG Inventur.

15. Jänner *(Jahr n)*	Übermittlung der THG Inventur an EK (für die Jahre 1990 bis zum Jahr n-2)
15. Jänner bis 28. Februar *(Jahr n)*	Überprüfung der Daten durch die EK
15. April *(Jahr n)*	Übermittlung der THG Inventur an die UNFCCC
Juni *(Jahr n)* bis März *(Jahr n+1)*	Überprüfung der Daten durch die UNFCCC: ● Stufe 1: Initial Check ● Stufe 2: Synthesis and Assessment ● Stufe 3: Individual Review
bis 15. Januar *(Jahr n + 1)*	Berücksichtigung der Kommentare der EK und der UNFCCC bei der Erstellung und Überarbeitung der THG Inventur

Zur Erfüllung der Anforderungen, die sich aus der Klimarahmenkonvention und vor allem aus dem Inkrafttreten des Kyoto-Protokolls am 16. Februar 2005 ergeben haben, wurde entsprechend Artikel 5.1 des Kyoto-Protokolls ein Nationales System eingerichtet. Ziel ist es, die Qualität der Inventur sicherzustellen und kontinuierlich zu verbessern. Dazu wurde ein Gesamtkonzept für das Nationale Inventur System Austria (NISA) entwickelt, das auf der *Österreichischen Luftschadstoff-Inventur* (OLI) als zentralem Kern aufbaut. Ein umfassendes Inventurverbesserungsprogramm und ein Qualitätsmanagementsystem entsprechend ISO/IEC 17020 sind ein wesentlicher Teil des NISA[3].

Der vorliegende Bericht wurde vom Umweltbundesamt auf Grundlage des Umweltkontrollgesetzes BGBl. Nr. 152/1998 erstellt. Dem Umweltbundesamt wird in diesem Bundesgesetz in § 6 (2) Z.15 unter anderem die Aufgabe übertragen, fachliche Grundlagen zur Erfüllung des Rahmenübereinkommens der Vereinten Nationen über Klimaänderungen zu erstellen. In § 6 (2) Z.20 werden die Entwicklung und Führung von Inventuren und Bilanzen zur Dokumentation des Zustandes und der Entwicklung der Umwelt sowie der Umweltbelastungen und ihrer Ursachen ausdrücklich als besondere Aufgaben des Umweltbundesamtes genannt.

Dieser Aufgabe wird mit der Erstellung sowie der jährlichen Aktualisierung der *Österreichischen Luftschadstoff-Inventur* (OLI) gemäß den in den relevanten internationalen Übereinkommen vereinbarten Richtlinien vom Umweltbundesamt nachgekommen. Die OLI deckt sowohl Treibhausgasemissionen, als auch Emissionen sonstiger Luftschadstoffe ab und ist damit u. a. die Datenbasis für die Erstellung des vorliegenden Berichts.

Datengrundlage

Das Umweltbundesamt führt jährlich eine Inventur des Ausstoßes von Luftschadstoffen durch, die als Grundlage für die Erfüllung der nationalen und internationalen Berichtspflichten herangezogen wird. Diese *Österreichische Luftschadstoff-Inventur* (OLI) wird erforderlichenfalls auch für zurückliegende Jahre aktualisiert, um eine vergleichbare Zeitreihe zur Verfügung zu haben. Die in diesem Bericht dargestellten Emissionsdaten ersetzen somit die publizierten Daten vorhergehender Berichte.

Tabelle B: Datengrundlage des vorliegenden Berichts.

Inventur	Datenstand	Berichtsformat
OLI 2012	15. Jänner 2013	Common Reporting Format (CRF)

[3] UMWELTBUNDESAMT (2005): NISA National Inventory System Austria, Implementation Report, REP-0004; Umweltbundesamt, Vienna.

ZUSAMMENFASSUNG

Die hier dargestellte Entwicklung der Treibhausgase in Österreich folgt in der Einteilung den Sektoren der Klimastrategie 2007.[4]

Treibhausgasbilanz 2011: Rückgang der Treibhausgasemissionen

Die Ergebnisse der aktuellen Treibhausgas-Inventur des Umweltbundesamts zeigen im Jahr 2011 einen Rückgang der Treibhausgasemissionen. 2011 wurden in Österreich 82,8 Mio. Tonnen Kohlendioxid-Äquivalent emittiert und somit um 2,6 % bzw. 2,2 Mio. Tonnen weniger als 2010. Unter Berücksichtigung der Beiträge aus dem JI/CDM-Programm und der Bilanz aus Neubewaldung und Entwaldung wird das Kyoto-Ziel von 68,8 Mio. Tonnen erreicht. Durch die rechtlichen Vorkehrungen, die 2012 zur Erweiterung des JI/CDM-Programms getroffen wurden, sind auch die bisher offenen Beträge aus den Jahren 2008–2010 abgedeckt.

Die Treibhausgasbilanz 2011 im Detail

Industrie und Energieaufbringung

Der Sektor Industrie ist mit ca. 24,5 Mio. Tonnen Kohlendioxid-Äquivalent im Jahr 2011 der größte Emittent an Treibhausgasen in Österreich. Gegenüber 2010 sind die Emissionen um rund 52.000 Tonnen gesunken. Während steigende Produktionszahlen in den Emissionshandelsbetrieben zu einem leichten Anstieg der THG-Emissionen um 1,1 % (+ 0,21 Mio. Tonnen) führen, ist im Nicht-Emissionshandelsbereich aufgrund des geringeren Erdgasverbrauchs ein Rückgang von 4,5 % (– 0,26 Mio. Tonnen) festzustellen.

Im Sektor Energieaufbringung wurden 2011 mit 14,0 Mio. Tonnen Kohlendioxid-Äquivalent um ca. 1,7 % (– 0,25 Mio. Tonnen) weniger emittiert als 2010. Bei den Anlagen, die im Emissionshandel erfasst sind, gingen die THG-Emissionen 2011 um 4,3 % (– 0,53 Mio. Tonnen) zurück. Ausschlaggebend dafür waren der reduzierte Gas- und Öleinsatz für die Strom- und Wärmeproduktion und höhere Netto-Stromimporte. Im Nicht-Emissionshandel hingegen sind die THG-Emissionen insbesondere durch den verstärkten Einsatz von Erdgas gegenüber 2010 um 13,1 % (+ 0,28 Mio. Tonnen) gestiegen.

Langfristig macht sich in diesem Sektor der Ersatz von Kohle und Heizöl durch Erdgas und Biomasse wie auch der Ausbau von erneuerbaren Energieträger in der Strom- und Wärmeproduktion deutlich bemerkbar: seit 1990 ist die Inlandstromproduktion um 26 %, die THG-Emissionen aus der Energieaufbringung nur um 1,1 % gestiegen.

[4] Die Entsprechung der Klimastrategie-Sektoren mit den Sektoren des CRF-Formats wie sie für den englischsprachlichen Teil dieses Berichts verwendet wird, ist wie folgt – CRF Bezeichnung in Klammern: Raumwärme (1.A.4), Verkehr (1.A.3+1.A.5), Energieaufbringung (1.A.1), Industrie (1.A.2+2 ohne F-Gase), Landwirtschaft (4), Abfallwirtschaft (6), F-Gase (F-Gase aus 2), Sonstige (1.B+3).

Verkehr

Die Treibhausgas-Emissionen im Sektor Verkehr betragen im Jahr 2011 ca. 21,8 Mio. Tonnen CO_2-Äquivalent, das sind um 0,7 Mio. Tonnen (– 3,1 %) weniger im Vergleich zu 2010. Die Emissionsabnahme ist auf den Rückgang des Kraftstoffabsatzes (– 3 %) aufgrund steigender Kraftstoffpreise und Effizienzsteigerungen beim spezifischen Verbrauch der Flotte zurückzuführen. Durch den Einsatz von Biokraftstoffen konnten im Jahr 2011 ca. 1,6 Mio. Tonnen Kohlendioxid-Äquivalent eingespart werden. Seit 1990 verzeichnet der Sektor Verkehr eine Emissionszunahme von 55 % wesentlich bedingt durch den Anstieg der Fahrleistung im Straßenverkehr.

Raumwärme & Kleinverbrauch

Auf den Sektor Raumwärme & Kleinverbrauch entfallen 2011 ca. 10,7 Mio. Tonnen Treibhausgase. Das entspricht einem Rückgang um 10,1 % gegenüber 2010, insbesondere eine Folge der milden Witterung 2011. Langfristig führt der verstärkte Einsatz von Fernwärme und Erneuerbaren Energieträgern sowie die bessere thermische Qualität der Gebäude zu einer deutlichen Rückgang der THG-Emissionen in diesem Sektor.

Landwirtschaft

In der Landwirtschaft wurden im Jahr 2011 ca. 7,6 Mio. Tonnen Treibhausgase emittiert und damit um 1,5 % mehr als im Jahr 2010 (+ 0,1 Mio. Tonnen). Seit 1990 sind die THG-Emissionen um 11,4 % (– 1,0 Mio. Tonnen) zurückgegangen. Dies ist auf den rückläufigen Viehbestand sowie die effizientere Stickstoffdüngung zurückzuführen, die kurzfristige Erhöhung auf den höheren Mineraldüngereinsatz im Jahr 2011.

Abfallwirtschaft

2011 wurden im Sektor Abfallwirtschaft 1,7 Mio. Tonnen CO_2-Äquivalent emittiert. Dies entspricht einem Rückgang um 5,3 % (– 0,1 Mio. Tonnen) gegenüber dem Vorjahr und um 52,4 % (– 1,9 Mio. Tonnen) gegenüber 1990. Neben der verstärkten Abfalltrennung, Wiederverwendung und dem Recycling sind auch die Deponiegaserfassung und die verstärkte thermische und mechanisch-biologische Behandlung von Siedlungsabfällen (Deponieverordnung) für diese Abnahme verantwortlich.

F-Gase und Sonstige

2011 wurden F-Gase im Ausmaß von 1,7 Mio. Tonnen CO_2-Äquivalent emittiert. Der Anstieg gegenüber dem Vorjahr (+ 1,7 % bzw. + 0,03 Mio. Tonnen) ist vor allem auf den verstärkten Einsatz von HFKWs als Kältemittel zurückzuführen.

Der Sektor „Sonstige“, insgesamt 0,8 Mio. Tonnen Kohlendioxid-Äquivalent im Jahr 2011, umfasst Lösemittelemissionen und flüchtige Emissionen aus der Energieträgerförderung und -verteilung. Die Emissionen sind seit 1990 weitgehend konstant.

1 INTRODUCTION

This report covers the Austrian greenhouse gas inventory data for the years 1990 to 2011; it presents the greenhouse gas emission data for the first, second, third and fourth year of the first commitment period under the Kyoto-Protocol.

The greenhouse gas inventory is submitted to the European Commission by the Austrian Federal Government in fulfilment of Austria's obligations under Article 3 of Decision 280/2004/EC ("Monitoring Decision"; replacing Decision 389/1992/EEC amended by Decision 296/1999/EEC) concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol. The purpose of this decision is to monitor all anthropogenic greenhouse gas emissions not controlled by the Montreal Protocol and to evaluate the progress towards meeting the greenhouse gas reduction commitments under the UNFCCC and the Kyoto Protocol.

According to the above mentioned decision and guidelines and the reporting requirements, which are the same as under the United Nations Framework Convention on Climate Change (UNFCCC), Member States are obliged to determine their anthropogenic emissions by sources and removals by sinks in accordance with the *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*, the *Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*, and the *IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry* as well as the Reporting Guidelines established by the Conference of the Parties to the UNFCCC and under the Kyoto Protocol.

The greenhouse gas inventory has to be submitted to the Commission every year no later than 15 January. Furthermore, Member States have to submit by 15 January elements of their National Inventory Reports (NIR) relevant for the preparation of the community inventory report (Article 3 (1) f). The elements of the so-called "Short-NIR" are further specified in Article 4 of the Implementing Provisions to 280/2004/EC (Commission Decision 2005/166/EC).

This report was prepared to fulfil the reporting obligations of Article 3 (1) f ("Short-NIR") and of Article 3 (1) i-k (Information on recalculations, reporting on indicators and information on changes of the national systems) of the Monitoring Decision. Since 2008 the reporting under Article 3 (1) g (information from the national registry) and 3 (1) h (information on legal entities authorised to participate in mechanisms of the Kyoto Protocol) is obligatory and is therefore also included in this report.

2 EMISSION TRENDS

Under the burden sharing agreement of the European Union, Austria is committed to a reduction of its greenhouse gas emissions by 13% below 1990 levels by 2008–2012.

The following figure depicts the trend of Austria's GHG emissions and also shows Austria's Kyoto Target for 2008–2012. The figure excludes emission sources and sinks from the sector Land Use, Land Use Change and Forestry (LULUCF) as reported under the UNFCCC.

It has to be noted that for judging the compliance under the Kyoto Protocol sources and sinks related to Article 3.3 of the Kyoto Protocol have to be considered, and also the use of flexible mechanisms under the Kyoto Protocol has to be accounted for.

In 2011 Austria's total greenhouse gas emissions (without LULUCF) amounted to 82.8 million tonnes CO_2 equivalents. Compared to the base year 1990 emissions increased by 6.0% and compared to 2010, emissions decreased by 2.6%. The trend is dominated by the trend of the most important sector – the energy sector.

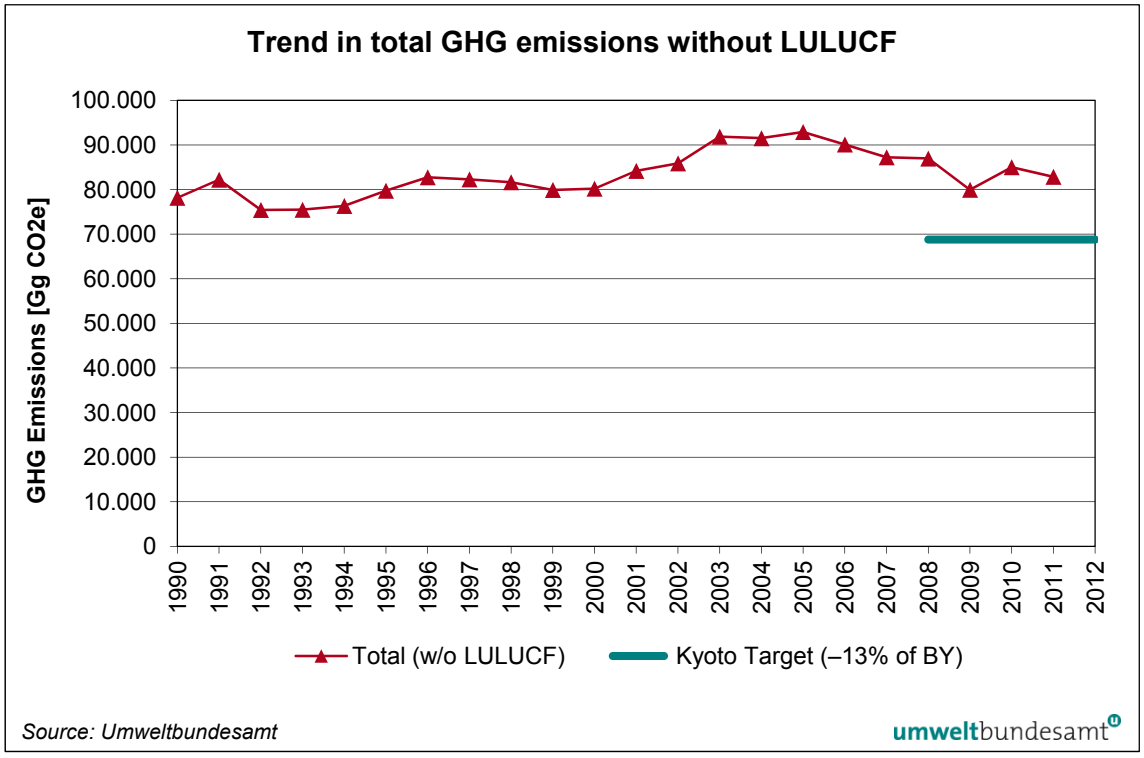

Figure 1: Trend in total GHG emissions 1990–2011 without LULUCF.

Development 2010–2011

The **key driver** for the emissions decline between 2010 and 2011 was the decreasing consumption of fossil fuels due to mild temperatures – heating degree days declined by 12% – as well as the high crude oil price.

GHG emissions from the sector **energy industries** declined by 1.7% from 2010 to 2011 as a result of the decreased use of oil and gas. The decreasing emissions in the subsector **other sectors** (-10.1% from 2010 to 2011) are also attributable to the decreased fuel consumption (gas, heating oil) due to the mild weather 2011. The number of heating degree days decreased by 12% from 2010 to 2011.

GHG emissions from **road transport** decreased by 3.5% compared to 2010, mainly due to a decrease in fuel consumption. Total road freight transport volume (tonne-kilometres transported in light and heavy duty trucks on road) decreased by 3.9%.

GHG emissions from **industrial processes** increased by 4.1% from 2010 to 2011, mainly due to rising production volumes due to the continuing recovery of the economy.

The sector **solvents** showed decreasing emissions (-0.9% from 2010 to 2011), as well as the sector **waste** (-5.3% from 2010 to 2011).

The sector **agriculture** showed an increase by 1.5% from 2010 to 2011.

Table 1: Summary of Austria's anthropogenic greenhouse gas emissions by sector.

GHG source and sink categories	1. Energy	2. Industry	3. Solvent	4. Agriculture	5. LULUCF*	6. Waste	7. Other
	CO_2 equivalents (Gg)						
1990	55 397	10 104	512	8 557	-9 927	3 587	NA
1995	57 670	9 821	422	8 720	-11 500	3 096	NA
2000	59 246	10 059	425	7 910	-14 936	2 558	NA
2001	63 365	10 027	425	7 863	-16 824	2 504	NA
2002	64 475	10 696	427	7 761	-10 880	2 522	NA
2003	70 589	10 747	418	7 555	-834	2 566	NA
2004	71 065	10 181	374	7 452	-5 892	2 447	NA
2005	72 112	10 637	387	7 414	-7 297	2 345	NA
2006	68 930	11 029	415	7 450	-1 485	2 269	NA
2007	65 736	11 446	388	7 517	-421	2 159	NA
2008	64 975	11 937	367	7 654	481	2 030	NA
2009	60 356	9 755	299	7 634	-3 540	1 911	NA
2010	64 607	10 807	327	7 467	-3 518	1 804	NA
2011	61 985	11 247	324	7 577	-3 491	1 708	NA

** Net emissions*

The most important GHG in Austria is carbon dioxide (CO_2) with a share of 85.0% in 2011. The CO_2 emissions primarily result from combustion activities. Methane (CH_4), which mainly arises from stock farming and waste disposal, contributed 6.5% to national total GHG emissions, and nitrous oxide with agricultural soils as the main source added another 6.4% in 2011. The remaining 2.1% was due to 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 2: Austria's anthropogenic greenhouse gas emissions by gas 1990–2011 without LULUCF.

Greenhouse gas emissions	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Total (without LULUCF)
	CO_2 equivalents (Gg)						
1990	62 060	8 304	6 198	23	1 079	493	**78 157**
1995	63 944	7 618	6 606	340	68	1 153	**79 729**
2000	65 970	6 623	6 289	647	67	602	**80 198**
2001	69 999	6 486	6 175	774	90	660	**84 184**
2002	71 714	6 389	6 177	875	83	643	**85 881**
2003	77 758	6 384	6 103	953	102	576	**91 876**
2004	78 216	6 242	5 408	1 020	125	507	**91 520**
2005	79 724	6 083	5 448	997	125	517	**92 895**
2006	77 033	5 962	5 482	1 004	137	475	**90 092**
2007	74 275	5 851	5 510	1 043	184	384	**87 246**
2008	73 922	5 706	5 695	1 082	167	391	**86 962**
2009	67 397	5 625	5 414	1 134	29	358	**79 956**
2010	72 591	5 536	5 184	1 286	64	352	**85 012**
2011	70 455	5 362	5 294	1 349	60	322	**82 842**

The dominant sector regarding GHG emissions in Austria is Energy, which caused 75% of total greenhouse gas emissions in Austria in 2011 (71% in 1990), followed by the Sectors Industrial Processes (13.6% in 2011) and Agriculture (9.1% in 2011).

Table 3: Austria's greenhouse gas emissions by sector in the base year (1990) and in 2011 as well as their share and trend.

GHG	1990	2011	Trend 1990–2011	1990	2011
	Emissions [Gg CO_2e]			Share [%]	
Total	**68 230**	**79 350**	**16.3%**	**100.0%**	**100.0%**
1 Energy	55 397	61 985	11.9%	70.9%	74.8%
2 Industry	10 104	11 247	11.3%	12.9%	13.6%
3 Solvent	512	324	-36.7%	0.7%	0.4%
4 Agriculture	8 557	7 577	-11.4%	10.9%	9.1%
5 LULUCF	-9 927	-3 491	-64.8%	–	–
6 Waste	3 587	1 708	-52.4%	4.6%	2.1%

Total emissions without emissions from LULUCF

In 2011 emissions from *Energy* are 11.9% higher than in the base year, emissions from *Industrial Processes* rose by 11.3%. All the other sectors show decreasing GHG emissions. The most significant decreases in absolute terms occurred in the sectors *Waste* and *Agriculture*.

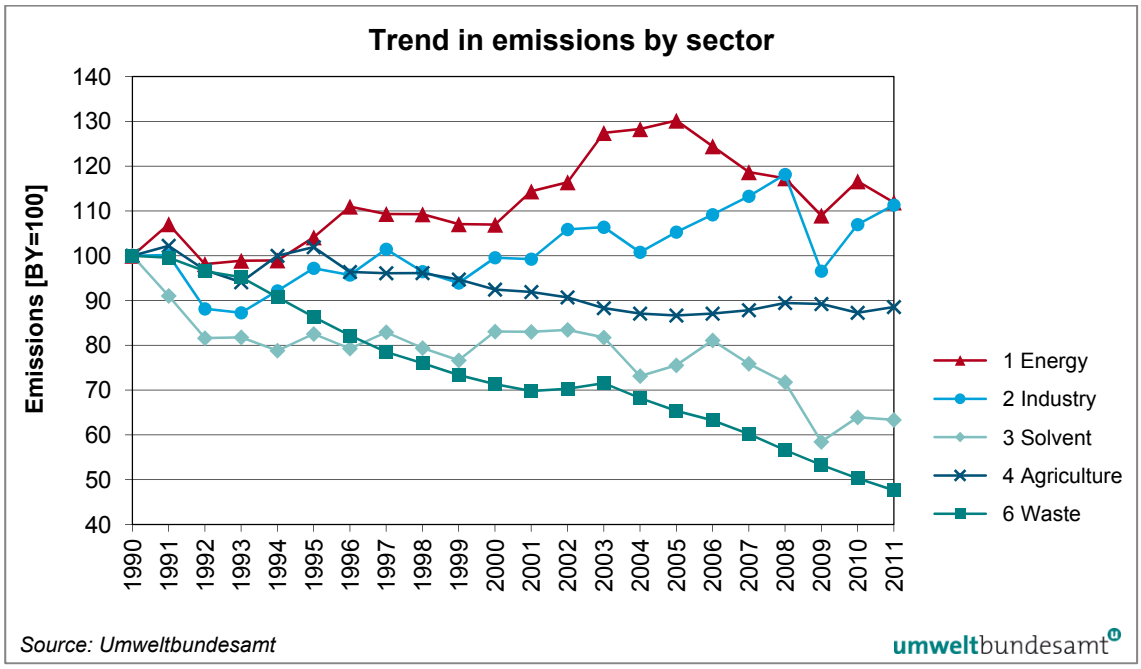

Figure 2: Trend in emissions 1990–2011 by sector in index form (base year 1990 = 100).

A more detailed description and interpretation of emissions trends per sector is given in the following sub-chapters.

2.1 Energy

In 2011, greenhouse gas emissions from the energy sector amounted to 61 985 Gg CO_2 equivalents which correspond to 75% of the total national emissions. 99% of the emissions from this sector originate from fossil fuel combustion; fugitive emissions from fuels are of minor importance.

The **most important sub-sector** of energy is transport with a share of 35% in 2011, followed by manufacturing industries and construction (24%), energy industries (23%), and the subsector other sectors (17%).

The **overall trend** in greenhouse gas emissions from the sector *Energy* shows increasing emissions with a plus of 11.9% from 1990 to 2011. The **main driver** for this trend is a strong increase of emissions from road transport (+56%). The dips and jumps from year to year are mainly due to:

- the weather circumstances in the corresponding years (in particular cold or mild winters, and/or dry or wet summers) which affect the heating demand, and the availability of climate change-friendly electricity from hydro power plants
- the economic situation

CO_2 contributed 98.1% to the total **greenhouse gas** emissions from the energy sector, CH_4 0.7% and N_2O 1.1%.

From 2010 to 2011 emissions from the energy sector decreased by 4.1%. Main drivers for the emissions reduction were the warm weather conditions which induced a lower use of heating oil and natural gas for space heating as well as reduced fuel sales to the transport sector and an increase of electricity imports which goes along with lower electricity production by thermal power plants.

Trend 1990-2011 – by subsector

The strong rise in emissions since 1990 from sub-sector **transport** (+55.0%) is due to an increase of road performance (kilometres driven). In addition to the increase of road performance within Austria, the amount of fuel bought in Austria but driven elsewhere – an effect mainly caused by different fuel prices in neighbouring countries compared to Austria – has increased considerably since 1990.

The gradual replacement of vehicles by newer, less consuming cars with less specific fuel consumption as well as the increased use of biofuels from 2005 onwards have contributed to the decreasing trend of the last few years. From 2010 to 2011 fuel consumption by road transport (gasoline, diesel and alternative fuels) declined by 3%, a decrease which was mainly due to increased fuel prices. Specific consumption per vehicle kilometer also declined between 2010 and 2011, by 2% for passenger cars and by 0.4% for heavy duty vehicles.

Energy related emissions from **manufacturing industries and construction** increased by 17.4% from 1990 to 2011. Fuel consumption increased by 44% in that period, mainly due to increased use of gas and especially biomass. As gas has a lower carbon content, and CO_2 emissions from biomass combustion are not accounted for under the UNFCCC reporting framework, the increase in GHG emissions is significantly smaller compared to the increase in fuel combustion.

In 2011 emissions from the sub-sector **energy industries** were 1.1% above the level in the base year 1990. Emissions from power plants were continuously decreasing since 2005, mainly because of the growing importance of renewable energy sources, the substitution of solid and liquid fuels by natural gas and biomass as well as improvements in efficiency. Since 1990 the share of biomass used as a fuel in this sector increased from 0.9% to 22% (2011), the contribution of hydro and wind power plants to total electricity production decreased from 72% to 69% (2011).

The variation in demand for heating and hot water generation due to climatic circumstances and the shift in the fuel mix are the most important drivers for emissions from the subsector **other sectors**. Emissions in 2011 were 25.5% lower than in the base year. This reduction is mainly attributable to the declining consumption of heating oil and solid fuels and an increase in biomass consumption. Total fuel consumption of this sub sector increased by 0.3% since 1990.

Fugitive emissions increased by 52% since the year 1990. This increase is mainly due to emissions from oil and natural gas production.

2.2 Industrial Processes

In 2011, greenhouse gas emissions from industrial processes amounted to 11 247 Gg CO_2 equivalents, which corresponds to 13.6% of the total national emissions.

The **overall trend** in greenhouse gas emissions from industrial processes shows increasing emissions with an increase of 11.3% from 1990 to 2011. Within this period emissions fluctuated showing a minimum in 1993. **Main drivers** for the trend in emissions from this sector were (i) the termination of the primary aluminium production in 1993, (ii) the introduction of N_2O abatement techniques in the chemical industry in 2004 and in 2009 (which became fully operational in 2010), continued in 2011 (iii) increasing metal production resulting in 15.1% higher GHG emissions in 2011 compared to 1990 and (iv) a strong increase of HFC emissions in the period 1992 to 2011 from 27 to 1 349 Gg CO_2 equivalents.

From 2010 to 2011, the overall emissions from this sector increased by 4.1% due to the recovery of industry from the effects of the economic downturn in 2009. The largest rise in emissions could be observed in Metal Production (+5.6 %) and the subcategory Mineral Products (+3.2%) due to higher production rates.

The most important **greenhouse gas** of this sector was carbon dioxide with 84% of emissions from this category, followed by HFCs with 12%, SF_6 with 2,9%, PFCs with 0.5%, N_2O with 0.4%, and finally CH_4 with 0.2%.

The **most important sub-sectors** of the industrial processes sector are metal production and mineral products, which caused 51% and 27% of the emissions from this sector in 2011.

2.3 Solvent and Other Product Use

In 2011, greenhouse gas emissions from solvent and other product use amounted to 324 Gg CO_2 equivalents, which corresponds to 0.4% of the total national emissions.

The **overall trend** in greenhouse gas emissions from solvent and other product use shows decreasing emissions, with a decrease of 37% from 1990 to 2011. The **main driver** is a decreasing use of solvents and solvent containing products as a result of legal measures and decreasing N_2O use.

From 2010 to 2011 emissions decreased slightly by 0.9%.

53% of these **greenhouse gas** emissions were indirect CO_2 emissions (resulting from the use of NMVOCs), 47% were contributed by N_2O emissions.

2.4 Agriculture

In 2011, emissions from agriculture amounted to 7 577 Gg CO_2 equivalent, which corresponds to 9.1% of the total national emissions.

The **overall trend** in greenhouse gas emissions from agriculture shows decreasing emissions, with a decrease of 11.4% from 1990 to 2011. The **main drivers** for this trend are decreasing livestock numbers and lower amounts of N-fertilizers applied on agricultural soils. Fluctuations which can be seen in particular in the first half of the 1990s result from the variability of mineral fertilizer sales data related to volatility in prices.

From 2010 to 2011 emissions increased by 1.5% due to an increased mineral fertilizer application in 2011.

In the Austrian **greenhouse gas** inventory the sector agriculture is the largest source for both N_2O and CH_4 emissions: In 2011 76% (13 Gg) of total N_2O emissions and 66% (169 Gg) of total CH_4 emissions in Austria originated from this sector. For N_2O this corresponds to 53% of the GHG emissions from agriculture and for methane to 47%.

The two **most important sub-sectors** of agriculture are enteric fermentation, which contributed 42% of total greenhouse gas emissions from the agricultural sector, followed by agricultural soils with a contribution of 41%.

2.5 LULUCF

In 2011, net removals from this category amounted to 3 491 Gg CO_2 equivalents, which corresponds to 4% of national total GHG emissions (without LULUCF) compared to 13% in the base year.[5]

The **overall trend** in net removals from LULUCF is minus 65% over the observed period. The **main driver** for this trend is the change of the biomass carbon stock in forest land. Fluctuations are due to weather conditions which affect the growth rates on the one hand (e.g. very low increment in 2003) and wind throws on the other, as well as timber demand and prices (e.g. very high harvest rates in 2007 and 2008).

The **most important sub-sector is** forest land (5.A) with net removals of 5 363 Gg CO_2 in 2011. CO_2, CH_4 and N_2O emissions arise from the other sub-sectors, with total net emissions amounting to 1 872 Gg CO_2 equivalents in 2011.

The last available NFI for the estimates in the forest sector is the NFI 2007/09. For the years after 2008 the mean results for the NFI period 2007/09 are reported as proxy data.

2.6 Waste

The **overall trend** in greenhouse gas emissions from waste shows decreasing emissions, with a decrease of 52.4% from 1990 to 2011. The **main driver** for this trend is the implementation of waste management policies: Waste separation, reuse and recycling activities have increased since 1990 and the amount of deposited waste has decreased correspondingly especially since 2004 when pre-treatment of waste became obligatory (although some exceptions were granted to some Austrian provinces). Furthermore, methane recovery has improved. The legal basis for the reduced deposition as well as the landfill gas recovery is the Landfill Ordinance. Since 2009 all waste has to be pre-treated before deposition (without exceptions).

From 2010 to 2011 GHG emissions decreased by 5.3% as a result of the implementation of the Landfill Ordinance described above as well as due to the declining emissions from waste being deposited in the past.

In 2011, greenhouse gas emissions from the waste sector amounted to 1 708 Gg CO_2 equivalents, which corresponds to 2.1% of the total national emissions.

The most important **greenhouse gas** of the waste sector is CH_4 with a share of 77.9% of the total GHG emissions from this sector in 2011, followed by N_2O with 22.0%, and CO_2 with 0.1%.

The **most important sub-sector** of the waste sector is solid waste disposal on land, which caused 73% of the emissions from this sector in 2011; the second largest source is waste water handling with a contribution of 17%.

[5] However, the LULUCF sector as described here is not included under the Kyoto Protocol, instead of that Article 3.3 KP activities are included: afforestation, reforestation and deforestation (Austria decided not to include activities under Article 3.4 of the KP).

3 METHOD OF REPORTING AND DATA BASIS

The Austrian greenhouse gas inventory for the period 1990 to 2011 was compiled according to the recommendations for inventories as set out in the UNFCCC reporting guidelines according to Decision 18/CP.8, the Common Reporting Format (CRF), Decision 13/CP.9, the new CRF for the Land Use, Land Use Change and Forestry Sector, the IPCC 1996 Guidelines for National Greenhouse Gas Inventories, which specify the reporting obligations according to Articles 4 and 12 of the UNFCCC as well as the IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories.

These regulations under the UNFCCC and the Kyoto Protocol define the standard for national emission inventories related to transparency, consistency, comparability, completeness and accuracy of inventories. Above this, each Party shall have in place a national system including all institutional, legal and procedural arrangements made within a Party for estimating anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and for reporting and archiving inventory information.

To meet these requirements Austria has set up a national system – the National Inventory System Austria (NISA) – covering all aspects from establishing a legal basis for inventory preparation along with defining responsibilities, over availability of data, quality control and quality assurance to continuous improvement of the inventory (see Chapter 3.3).

In Austria, emissions of greenhouse gases are estimated together with emissions of air pollutants in a database based on the CORINAIR (CORe INventory AIR)/SNAP (Selected Nomenclature for sources of Air Pollution) system. This nomenclature is designed to estimate not only emissions of greenhouse gases but all kinds of air pollutants. To comply with the reporting obligations under the UNFCCC, emissions are transformed according to the IPCC Guidelines into the UNFCCC Common Reporting Format (CRF).

The Austrian greenhouse gas inventory is subject to continuous improvement, resulting in recalculations as outlined in Chapters 3.1 and 3.5. Issues identified in the inventory reviews by the UNFCCC are considered in the inventory improvement programme. The last in-depth review took place in September 2008.

Annex 1 to this report presents Austria's greenhouse gas inventory data (CO_2 emissions/CO_2 removals, CH_4, N_2O, HFC, PFC and SF_6) in the format of the CRF Summary Table 10 (Emission Trends).

The complete tables of the Common Reporting Format, including in particular Sectoral Reports, Sectoral Background Tables and the Reference Approach for CO_2 are submitted separately in digital form only.

Table 4: Status of the present report.

Reporting Obligation	Format	Inventory	Version
Mechanism for monitoring Community greenhouse gas emissions	Common Reporting Format (CRF)	OLI 2012	January 15th 2013

3.1 Relation with data reported earlier

As a result of the continuous improvement of Austria's GHG inventory, emissions of some sources have been recalculated on the basis of updated data or revised methodologies, thus emission data for 1990 to 2010 which are submitted this year differ slightly from data reported previously.

The following table presents the recalculation difference with respect to last years' submission for each gas (positive values indicate that this years' estimate is higher).

Table 5: Recalculation difference of Austria's greenhouse gas emissions compared to the previous submission.

	1990 (Base year)	2010
	Recalculation Difference [%]	
Total	**-0.01%**	**+0.49%**
CO_2	0.00%	+0.42%
CH_4	-0.01%	-0.69%
N_2O	-0.01%	+0.60%
HFC, PFC, SF_6	-0.29%	+7.97%

Emissions without LULUCF

National total emissions (excluding LULUCF) for the **base year** have been slightly revised since last years' submission (-0.01%). The revised value for **2010** is 0.49% (418 Gg CO_2 equivalents) higher than the value submitted last year. These recalculations resulted in a revised trend 1990-2010 from +8.2% to +8.8%.

The higher GHG emissions of the year 2010 are mainly attributable to recalculated emissions of fluorinated gases (sector 2.F) as a consequence of extensive QA and verification activities of the model applied and revisions of the energy balance. Revisions of CH_4 and N_2O arise in the sectors 1B (CH_4) and 1.A.1.a (N_2O) due to a revision of the consumption of biomass.

A description of all recalculations by each sector is given in Chapter 3.5.

Table 6 in Chapter 3.5.8 shows all improvements made in response to the UNFCCC review process. Chapter 3.5.9 shows the improvements made in response to the ESD review[6] that has been conducted 2012.

3.2 Information on Completeness

Geographical coverage is complete. There is no part of the Austrian territory that has not been covered by the inventory.

Emissions from most sources specified in the CRF have been estimated. For information on sources not estimated („NE") and emissions included with sources other than those stipulated in the CRF („IE") please refer to Table 9 Completeness of the CRF.

[6] In 2012 GHG inventories were subject to a technical review performed according to the ESD Review Guidelines, with the aim of supporting the determination of Member States' annual emission allocations under Decision No 406/2009/EC (Effort-Sharing Decision).

3.3 National Inventory System Austria (NISA)

This section provides a short description of the most important aspects of NISA; a detailed description including all required information as set down in Decision 15/CMP.1, part II ("Reporting of supplementary information under Article 7, paragraph 2", D. National systems in accordance with Article 5, paragraph 1) can be found in the Austrian Initial Report[7], in Austria's NIR 2011[8] and in the NISA Implementation Report[9].

Legal Arrangements

Austria has a centralized inventory system, with all the work related to inventory preparation being carried out at a single national entity. The most important legal arrangement is the Austrian Environmental Control Act (Umweltkontrollgesetz[10]), which defines the main responsibility for inventory preparation and identifies the Umweltbundesamt as the single national entity with the overall responsibility for inventory preparation. Within the Umweltbundesamt the "Inspection Body for Emission Inventories" is responsible for the compilation of the greenhouse gas inventory.

To ensure the availability of data necessary for the annual compilation of the GHG inventory further legal and institutional arrangements have been made, which are described in more detail in Austria's NIR and in full detail in the NISA Implementation Report.

QMS

A Quality Management System (QMS) has been designed and implemented to fulfil all requirements of *good practice*. Since 2005, the unit in the Umweltbundesamt responsible for inventory preparation is accredited according to the Standard ISO/ICE 17020 *General Criteria for the operation of various types of bodies performing inspections* as "Inspection Body for Emission Inventories". This standard takes into account standards regarding a QMS as set out in the EN/ISO 9000 series and goes beyond: it also provides a clear statement of requirements regarding competence and independence; impartiality, integrity and confidentiality.

Sector Experts

Within the inventory system specific responsibilities for the different emission source/sink categories ("sector experts") are defined. Sector experts collect activity data, emission factors and all relevant information needed for finally estimating emissions. The sector experts are also responsible for the choice of methods, data processing and archiving and for contracting studies, if needed. As part of the quality management system, the head of the "Inspection body for GHG inventory" approves the methodological choices. Finally, sector experts perform Quality Assurance and Quality Control (QA/QC) activities.

The main data sources used, as well as information on who did the actual calculations, are presented in the Chapter 3.4.

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[7] BMLFUW (2006): Austria's Initial Report under Article 7, paragraph 4, of the Kyoto Protocol, Federal Ministry of Agriculture and Forestry, Environment and Water Management, Vienna

[8] UMWELTBUNDESAMT (2011): Austria's National Inventory Report 2011, Submission under the United Nations Framework Convention on Climate Change and under the Kyoto Protocol, REP-0308; Umweltbundesamt, Vienna

[9] UMWELTBUNDESAMT (2005): NISA National Inventory System Austria, Implementation Report, REP-0004; Umweltbundesamt, Vienna. http://www.umweltbundesamt.at/umweltkontrolle/

[10] „Umweltkontrollgesetz"- Bundesgesetz über die Umweltkontrolle und die Einrichtung einer Umweltbundesamt Gesellschaft mit beschränkter Haftung; Federal Law Gazette 152/1998

Data Management

The Austrian Inventory is based on the SNAP nomenclature and has to be transformed into the UNFCCC Common Reporting Format to comply with the reporting obligations under the UNFCCC. In addition to the actual emission data, the background tables of the CRF are filled in by the sector experts, and finally QA/QC procedures as defined in the inventory planning process are carried out before the data are submitted to the European Commission and to the UNFCCC.

As part of the QMS's documentation and archiving procedures a reliable data management system has been established to fulfil the data collecting and reporting requirements. This ensures the necessary documentation and archiving for future reconstruction of the inventory and consequently enables easy access to up-to-date and previously submitted data for the quantitative evaluation of recalculations.

Corrective and Preventive Actions

As part of the QMS an efficient process is established to grant transparency when collecting and analyzing findings by UNFCCC review experts or any other issues concerning the quality of activity data, emission factors, methods and other relevant technical elements of inventories. Any findings and discrepancies are documented; responsibilities, resources and a time schedule are attributed to each of these in the improvement plan. Measures, which include possible recalculations, are taken by the sector experts.

Changes since the last submission

There were no changes in the NISA since the last submission.

3.4 Sources of data

The national energy balance is the most important data basis for the Austrian Air Emissions Inventory. The Austrian statistical office (Statistik Austria) is required by contract with the Federal Ministry of Agriculture, Forestry, Environment and Water Management and with the Federal Ministry of Economics and Labour to annually prepare the national energy balance. The compilation of several other relevant statistics is regulated by law; other data sources include reporting obligations under national and European regulations and reports of companies and associations.

The following table presents the main data sources used for activity data as well as information on who did the actual calculations (for unpublished studies a detailed description of the methodologies is given in the NIR):

Table 6: Main data sources for activity data and emission values.

Sector	Data Sources for Activity Data	Emission Calculation
Energy	Energy Balance from Statistik Austria; EU-ETS; Steam boiler database; direct information from industry or associations of industry	Umweltbundesamt, plant operators
Transport	Energy Balance from Statistik Austria	Umweltbundesamt (Aviation), Technical University Graz (Road and Off-road transport)

Sector	Data Sources for Activity Data	Emission Calculation
Industry	National production statistics, import/export statistics; EU-ETS; direct information from industry or associations of industry	Umweltbundesamt, plant operators F-gases based on a study by: Öko-Recherche GmbH, Frankfurt (2010)
Solvent	Short term statistics for trade and services Austrian foreign trade statistics Structural business statistics Surveys at companies and associations	Umweltbundesamt, based on studies by: Institut für industrielle Ökologie and Forschungsinstitut für Energie und Umweltplanung, Wirtschaft und Marktanalysen GmbH[11]
Agriculture	National Studies, national agricultural statistics obtained from Statistik Austria	Umweltbundesamt, based on studies by: University of Natural Resources and Applied Life Sciences, Research Center Seibersdorf
LULUCF	National forest inventory obtained from the Austrian Federal Office and Research Centre for Forests National agricultural statistics and land use statistics obtained from Statistik Austria	Umweltbundesamt
Waste	Database on landfills (1998–2007), Electronic Data Management (EDM) in environment and waste management	Umweltbundesamt

The main sources for emission factors are:

- national studies for country specific emission factors
- plant-specific data reported by plant operators
- Intergovernmental Panel on Climate Change (IPCC) Guidelines
  - Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories and the IPCC Good Practice Guidance[12];
  - 2000 IPCC Good Practice Guidance (GPG) and Uncertainty Management in National Greenhouse Gas Inventories[13];
  - 2003 Good Practice Guidance for Land Use, Land-Use Change and Forestry[14];
  - 2006 IPCC Guidelines for National Greenhouse Gas Inventories[15].
- EMEP/CORINAIR Emission Inventory Guidebook
  - 2nd edition – 1999. EEA Technical Report No. 30.
  - 3rd edition October 2002 UPDATE. EEA Technical report No 30[16]
  - 2006, EEA Technical report No 11/2006[17]
  - 2007, EEA Technical report No 16/2007[18]

[11] Research Institute for Energy and Environmental Planning, Economy and Market Analysis Ltd./Institute for Industrial Ecology

[12] http://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html

[13] http://www.ipcc-nggip.iges.or.jp/public/gp/english/index.html

[14] http://www.ipcc-nggip.iges.or.jp/public/gpglulucf/gpglulucf.html

[15] http://www.ipcc-nggip.iges.or.jp/public/2006gl/index.htm

[16] http://reports.eea.europa.eu/EMEPCORINAIR3/en/page002.html

[17] http://reports.eea.eu.int/EMEPCORINAIR3/en

- EMEP/EEA air pollutant emission inventory guidebook – 2009. Technical report No. 6/2009.[19] (previously known as EMEP/CORINAIR Emission Inventory Guidebook)

A complete list of data sources for activity and emission data or emission factors used by sector for the submission 2013 can be found in the National Inventory Report 2013 to be published in spring 2013.

Table *Summary 3* of the CRF (Summary Report for Methods and Emission Factors Used) presents the methods applied and the origin of emission factors used in the present Austrian GHG inventory.

3.5 Recalculations

This chapter describes the changes made to the inventory since the last submission to the UNFCCC (April 2013). Further background information and a complete description of the recalculation of the inventory for the period 1990–2010 will be given in Austria's National Inventory Report 2013, which will be published in spring 2013.

3.5.1 Energy (Sector 1)

Combustion Activities (1 A)

Stationary sources

Update of activity data

Updates of activity data and of NCVs follow the updates of the IEA-compliant energy balance compiled by the federal statistics authority Statistik Austria.

Energy balance update and corrections

Main revisions affected the years 2009 and 2010 and minor revisions have been carried out for the year 2005. Solid biomass has been increased for power plants (1.A.1.a) by about 8 PJ and for wood processing industries (1.A.2.f) by about 4 PJ for the year 2010. For the years 2009 and 2010 about 3 to 4 PJ of natural gas from power plants, for the year 2010 about 3 PJ from other energy industries (1.A.1.c) and for the years 2009 to 2010 about 4 to 6 PJ of natural gas have been shifted to the subsector other sectors (1.A.4). Consumption of waste incineration plants (1.A.1.a) has been increased by about 1.6 PJ for the years 2009 and 2010.

Emissions from non energy use of natural gas other than for Ammonia production has been revised which leads to an increase of CO_2 emissions of about 100 Gg CO_2 in 2010.

For the year 2007 the operator of the integrated iron and steel plants (1.A.2.a) reported revised emissions which are now 90 Gg CO_2 lower.

[18] Prepared by the UNECE/EMEP Task Force on Emissions Inventories and Projections (TFEIP) and published by the European Environment Agency (EEA). Copenhagen 2007.
http://reports.eea.europa.eu/EMEPCORINAIR5/en/page002.html

[19] Prepared by the UNECE/EMEP Task Force on Emissions Inventories and Projections (TFEIP) and published by the European Environment Agency (EEA). Copenhagen 2009.
http://www.eea.europa.eu/publications/emep-eea-emission-inventory-guidebook-2009

Mobile sources

Update/Improvement of activity data

In 2011, the following updates have been implemented in the transport emission calculation models GLOBEMI and GEORG which result in revised emission data for the whole time series:

1.A.3.b Road Transport

Because of updates due to changes in the time series of the national energy balance the levels for liquid gas, natural gas and biogas changed retrospectively. The years concerned are especially between 2000 and 2003 and 2009.[20]

1A2f, 1A4a,b,c Mobile Sources (Off-Road)

Minor recalculations have occurred due to the introduction of emission level 4 (European emission standards for new off-road engines) in the emissions model for off-road equipment for combustion >56 KW, that has required a reallocation of mobile machinery and equipment according to size classes.[11]

Update of methodology and emission factors

1.A.3.b Road Transport

Adaptation of the specific CO_2 emission factors of passenger cars according to the national CO_2 monitoring data[21] for the Austrian fleet has caused a slight change in specific consumption from last year's inventory.

3.5.2 Fugitive Emissions (1 B)

1.B.2.b.iii Transmission and 1.B.2.b.iv Distribution

During the last years several technical measures were implemented to reduce fugitive emissions from gas transmission and distribution and gas storage. These emission reductions were assessed in a national study[22]. Based on the results of this study and activity data that is either publically available (storage) or provided by the Association of Gas- and District Heating Supply Companies (transmission) the country specific methane emission factors for the years 2000 to 2010 were updated.

3.5.3 Industrial Processes (Sector 2)

2.A.1 Cement Production

Emission factors for TSP were revised from 2008 onwards based on new available figures from the cement study, leading to a minor decrease of emissions.

2.A.3 Limestone and Dolomite use

Revised activity data led to recalculations from 2008 onwards leading to a minor increase of emissions.

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[20] Hausberger, S. / Schwingshackl, M. (2012): Straßenverkehrsemissionen und Emissionen sonstiger mobiler Quellen Österreichs für die Jahre 1990 bis 2011; erstellt im Auftrag der Umweltbundesamt GmbH, Graz, 2012.

[21] Lebensministerium (2012): CO_2 Monitoring 2011. Zusammenfassung der Daten der Neuzulassungen von Pkw der Republik Österreich gemäß Entscheidung Nr. 1753/2000/EG für das Berichtsjahr 2011. Wien, 2012.

[22] Life Cycle Inventory „Erdgasbereitstellung Austria – Update 2010", C. Wartha, Fachhochschulstudiengänge Burgenland GmbH, Pinkafeld 2011

2.C.1 Pig Iron and Electric Furnace Activity

Activity data for the entire time series was updated as revised data of the energy balance became available in 2012. This resulted in changes (both increasing and decreasing) in emissions in several years throughout the time series.

2.F.1/2/3/4/5 ODS Substitutes (HFCs)

Extensive QA and verification activities (review of the methodology and validation of the calculation) led to major improvements in the sub category 2F1 and minor improvements of consistency and transparency in all relevant sub categories.:

~ 2F1 sub categories supermarkets and other commercial (both reported under "commercial refrigeration"), industrial refrigeration and stationary air conditioning (excluding room AC and heating pumps): inconsistencies in the stock data were eliminated by setting up a new approach that now interpolates basic data (total amounts used per year) and therefore gives results for every year, whereas the old approach inter- or extrapolated stock values and emissions (this leads to lower emissions for the years before 2004, as the stock data previously was overestimated, and higher emissions after 2007 as previously emissions of 2007 were also reported for 2008 and 2009). In the new approach inconsistencies of the IEF for 2010 detected in the course of the ESD review were also eliminated. For the year 2010 emissions from decommissioning had to be recalculated leading to higher emissions.

~ 2F1 sub category mobile air conditioning: only part of the stock of passenger cars was considered, this was corrected.

3.5.4 Solvent and other Product Use (Sector 3)

No recalculations were made in this years' submission.

3.5.5 Agriculture (Sector 4)

Update of activity data

4.B.6 Horses, 4.B.9 Poultry, 4.B.13 Other

Animal numbers of horses, poultry and other animals have been updated with new activity data from the 2010 Agricultural Structure Survey. This update resulted in an increase of 2010 emissions from other animals (furred game, mainly deer) and poultry (chicken and other poultry) and a decrease of 2010 emissions from horses.

4.F Field Burning of Agricultural Waste

Activity data on viniculture areas have been updated for 2010, resulting in a slight decrease of emissions.

Improvements of methodologies and emission factors

4.B Manure Management

In the Austrian QMS regularly extensive QA and verification activities are carried out (Tier 2 QA). In 2012 the agriculture sector was validated. Some minor inconsistencies with respect to the AWMS data used in the THG inventory have been found and corrected.

The share of anaerobic digestion has been revised on the basis of new input data provided by the Austrian Energy Regulator E-Control.

3.5.6 LULUCF (Sector 5)

Revisions of the data series for LULUCF are due to the following changes:

5.B Cropland

The estimates of soil C stock changes in CL rem. CL for the whole reporting period were updated on basis of the most recent cropland management statistics.

5.C Grassland

The estimates of soil C stock changes in GL rem. GL for the whole reporting period were updated on basis of the most recent grassland management statistics. A calculation error in the estimates was identified and also corrected.

5.E Settlements

An update of the grassland areas in the most recent years led to a different availability of LUC lands GL to SL due to area consistency in the most recent years. As a consequence, the related emissions/removals of this LUC category had to be revised.

LULUCF KP estimates

Deforestation – N_2O: A unit calculation error was corrected.

3.5.7 Waste (Sector 6)

Update of activity data

6.B Wastewater Handling

New data on the connection of the Austrian population to the municipal sewage system became available for 2010, leading to revised emissions of CH_4 and N_2O for 2010 and 2009 (2009 due to interpolation).

6.D Other waste

GHG emissions for 2010 have been recalculated (+1.3%) on basis of new activity data on waste amounts treated in mechanical-biological treatment plants.

3.5.8 Improvements made in response to the UNFCCC Review

Improvements made for the submission 2013 in response to the issues raised in the UNFCCC review process are summarized in Table 7, as far as methodological issues are concerned as well as improvements resulted in revised emission data. All other improvements (e.g. those made with regard to transparency or explanatory issues) will be included in the NIR 2013.

Table 7: Improvements made in response to the UNFCCC review process.

Finding	Reference	Improvement made
Energy		
No improvements resulting in revised emissions were made in response to the UNFCCC Review process		
Fugitive Emissions		
No improvements resulting in revised emissions were made in response to the UNFCCC Review process		
Industrial Processes		
No improvements resulting in revised emissions were made in response to the UNFCCC Review process		

Finding	Reference	Improvement made
Solvents and Other Product Use		
No improvements resulting in revised emissions were made in response to the UNFCCC Review process		
Agriculture		
No improvements resulting in revised emissions were made in response to the UNFCCC Review process		
LULUCF		
Grassland remaining grassland - carbon stock changes in mineral soils. The ERT considers that more recent data (management factors) should be used to more accurately reflect recent management status. During the review, the Party indicated that it intends to update the estimates based on more recent data. The ERT recommends that Austria conduct this work to update the estimates and report on the updated results in its next annual submission.	ARR 2012 § 75	The estimates of soil C stock changes in GL rem. GL for the whole reporting period were updated on basis of the most recent grassland management statistics
KP LULUCF		
Deforestation – N_2O: The ERT recommends that Austria correct the calculation error (unit conversion) regarding calculation of N_2O from deforestation.	ARR 2012 § 89	The error was corrected.
Waste		
No improvements resulting in revised emissions were made in response to the UNFCCC Review process		

3.5.9 Improvements made in response to the ESD Review 2012

The following table presents Table 3 of the 'final report of the 2012 technical review of the greenhouse gas emission inventory of Austria' (17 August 2012) with regard to the issues on HFC. Recommendations on sector Energy have been carefully verified, but have not resulted in revisions in this years' submission and are therefore not included.

Table 8: Improvements made in response to the ESD review 2012.

Recommendation	Reference	Improvement made
Industrial Processes		
2.F(a).1. Industrial refrigeration. HFC. 2008, 2009: The TERT recommends that Austria collects annual data in order to improve the accuracy of the estimates.	Final Report of 2012 technical review of the GHG inventory of Austria	Inconsistencies in the stock data were eliminated by setting up a new approach that now interpolates basic data (total amounts used per year) and therefore gives results for every year, whereas the old approach extrapolated stock values and emissions.
2.F(a).1. Stationary air conditioning. HFC. 2008-2010: The TERT recommends that Austria collects annual data to improve the accuracy of the estimates.	Final Report of 2012 technical review of the GHG inventory of Austria	
2.F(a).3. Fire extinguishers. HFC. 2009-2010: In order to improve the accuracy of the estimates, the TERT recommends that Austria collects plant-specific data or, if this is not possible, uses appropriate interpolation/extrapolation techniques (for example, by using 2009 and 2010 statistics from the Austrian Fire Protection Association).	Final Report of 2012 technical review of the GHG inventory of Austria	Extrapolation using the statistics from the Austrian Fire Protection Association didn't prove to be reliable enough, and data from the respective company is not available due to a legal conflict. Therefore data is still extrapolated as no better methodology is currently available.

3.6 Quality Assurance and Quality Control (QA/QC)

A quality management system (QMS) has been designed to achieve to the objectives of *good practice guidance*, namely to improve transparency, consistency, comparability, completeness and confidence in national inventories of emissions estimates. The QMS is based on the International Standard ISO/IEC 17020 *General Criteria for the operation of various types of bodies performing inspections*. The QMS ensures that all requirements of a type A inspection body as stipulated in ISO/IEC 17020 are met, which include strict independence, impartiality and integrity. Since December 2005 the Umweltbundesamt has been accredited as inspection body (Id.No.241) in accordance with the Austrian Accreditation Law.

The implementation of QA/QC procedures as required by the IPCC-GPG support the development of national greenhouse gas inventories that can be readily assessed in terms of quality and completeness. The QMS as implemented in the Austrian inventory includes all elements of the QA/QC system outlined in IPCC-GPG Chapter 8 ”Quality Assurance and Quality Control”, and goes beyond. It also comprises supporting and management processes in addition to the QA/QC procedures in inventory compilation and thus ensures agreed standards not only within (i) the inventory compilation process and (ii) supporting processes (e.g. archiving), but also for (iii) management processes (e.g. annual management reviews, internal audits, regular training of personnel, error prevention).

The Austrian Quality Management System is described in detail in Austria’s NIR 2012[7)].

Changes to the QMS since the last submission

On the 13th and 14th January 2011 a comprehensive external audit by the accreditation body took place at the Umweltbundesamt. This ‘Re-Accreditation’ is obligatory every 5 years and aims at examining the “Inspection Body for Emission Inventories” respectively its QM-System in detail. Only minor measures were to be implemented, generally it confirmed the inspection body’s commitment to high quality, and approved conformity with the standard renewing the accreditation of 2005.

On April 3rd 2012 an external audit led by a representative appointed by the accreditation body has taken place to assess the QM system with regard to compliance with the underlying standard ISO 17020, to check its implementation in practice and to assure that measures and recommendations as set out in previous audits have been implemented accordingly. Such an audit is obligatory every 15 months. The final judgement of the auditor confirmed the compliance and practicability of the QM system; only two small improvement measures regarding transparency of the System have been raised that could easily be implemented in the Quality Management Manual.

Following a recommendation of the accreditation audit to streamline the documentation of the management system, a completely revised quality manual was produced; in the course of this work the revision of ISO/IEC 17020 was taken into account, the new manual being more user-friendly and providing an improved presentation of requirements relating to reporting obligations in the context of emission inventories. The management processes of the QMS and the process of inventory preparation remained mostly unchanged; however the documentation and some blanks and checklists have been improved (e.g. the checklists for QA/QC that have been incorporated into the documentation files, and simplification of the management review process and report, respectively).

The Quality Manual can be downloaded at
http://www.umweltbundesamt.at/umweltsituation/luft/emissionsinventur/emi_ueberwachung/

3.7 Uncertainty Assessment

After a first uncertainty analysis in 2000[23] and sector-specific uncertainty updates by expert judgements in the following years, a second comprehensive uncertainty analysis was performed by WINIWARTER the greenhouse gases CO_2, CH_4, N_2O, HFC, PFC and SF_6 for 1990 and 2005. Information on the more general results of this uncertainty analysis can be found in Austria's NIR 2008[24]. Table 8 shows the key results of the latest uncertainty evaluation of the Austrian GHG Inventory implemented at last for the submission of the National Inventory Report 2011[25] using the method developed in WINIWARTER (2008)[26] based on the Tier 2 approach (Monte-Carlo Analysis).

Table 9: Key results of the Austrian GHG inventory uncertainty analysis 2012.

	Random uncertainty	CO_2	CH_4	N_2O	PFC*	HFC	SF_6*	Total GHG emissions
1990	Mean value [Tg]	62.06	8.30	6.19	1.08	0.03	0.49	78.16
	Standard deviation	0.42	0.63	2.62	0.26	0.01	0.04	2.74
	2s	**1.3%**	**15.1%**	**84.5%**	**48.6%**	**49.8%**	**16.2%**	**7.0%**
2010	Mean value [Tg]	72.29	5.57	5.15	0.07	1.16	0.35	84.59
	Standard deviation	0.61	0.40	2.25	0.00	0.31	0.08	2.38
	2s	**1.7%**	**14.5%**	**87.3%**	**11.2%**	**53.9%**	**44.6%**	**5.6%**

**Due to the definition of key category FC emissions from 2.F.7, PFC emissions are partly considered in SF_6 emissions.*

Uncertainty calculation and reporting according to IPCC GPG (2000) Table 6.1 for key categories is presented in Annex II.

3.8 Comparison of the Sectoral Approach with the Reference Approach

In this chapter, CO_2 emissions from the sectoral and reference approach are compared and explanations for the differences are provided.

Table 10 shows CO_2 emissions calculated from the two approaches.

[23] WINIWARTER, W. & RYPDAL, K. (2001): Assessing the Uncertainty Associated with National Greenhouse Gas Emission Inventories: A Case Study for Austria, Atmospheric Environment 35 (2001) 5425–5440.

[24] UMWELTBUNDESAMT (2008): Anderl, M.; Freudenschuß, A.; Kampel, E.; Köther, T.; Muik, B; Poupa S.; S.; Schodl, B.; Schwaiger, E., Weiss, P.; Wieser, M. & Zethner, G.: Austria's National Inventory Report 2008. Reports, Bd. REP-152. Umweltbundesamt, Wien.

[25] As the uncertainties of the national total emissions estimated by Tier 2 analysis did not vary significantly over the last years, Austria decided to perform the Monte Carlo analysis every two years instead of every year. The next Tier 2 analysis will be provided in National Inventory Report 2011.

[26] WINIWARTER, W. (2008): Quantifying Uncertainties of the Austrian Greenhouse Gas Inventory, ARC-sys-0154.

Table 10: CO_2 emissions by type of fuel.

Year	Reference Approach				Sectoral Approach *1 A Fuel Combustion*				
	Liquid [Gg CO_2]	Solid [Gg CO_2]	Gaseous [Gg CO_2]	**Total [Gg CO_2]**	Liquid [Gg CO_2]	Solid [Gg CO_2]	Gaseous [Gg CO_2]	Other [Gg CO_2]	**Total [Gg CO_2]**
1990	28 022	17 039	12 146	**57 207**	28 113	13 924	11 301	732	**54 070**
1991	30 424	17 789	12 841	**61 055**	30 589	14 518	11 940	805	**57 852**
1992	29 519	13 908	12 610	**56 037**	29 322	10 666	12 000	956	**52 945**
1993	30 603	12 542	13 298	**56 444**	30 731	9 495	12 453	675	**53 354**
1994	29 938	12 723	13 679	**56 339**	30 100	9 379	13 111	820	**53 410**
1995	30 454	14 414	14 935	**59 804**	30 309	10 741	14 339	839	**56 228**
1996	32 883	14 491	15 897	**63 270**	32 921	10 760	15 287	1 073	**60 041**
1997	32 399	15 304	15 321	**63 024**	32 123	11 318	14 720	1 017	**59 179**
1998	34 559	13 559	15 729	**63 847**	34 247	8 905	15 144	818	**59 114**
1999	32 540	13 513	16 004	**62 056**	32 399	9 217	15 412	828	**57 856**
2000	31 849	15 072	15 273	**62 194**	31 880	10 423	14 686	834	**57 824**
2001	34 197	15 513	16 186	**65 896**	34 130	11 177	15 632	958	**61 897**
2002	34 755	15 829	16 160	**66 744**	35 220	11 078	15 582	1 163	**63 043**
2003	37 212	16 846	17 721	**71 779**	38 052	12 540	17 092	1 389	**69 073**
2004	37 675	16 538	18 042	**72 255**	38 417	12 245	17 405	1 505	**69 572**
2005	38 716	16 660	19 116	**74 493**	38 864	11 889	18 460	1 374	**70 586**
2006	37 304	16 866	17 949	**72 118**	36 993	11 679	17 269	1 486	**67 426**
2007	36 383	15 976	16 927	**69 286**	35 692	10 808	16 324	1 430	**64 255**
2008	35 332	14 747	17 887	**67 967**	34 639	10 187	17 219	1 495	**63 541**
2009	33 400	11 260	17 515	**62 175**	32 693	7 667	16 873	1 690	**58 923**
2010	34 969	13 255	19 246	**67 470**	33 790	9 058	18 504	1 797	**63 150**
2011	32 520	13 649	18 169	**64 338**	31 791	9 407	17 470	1 930	**60 597**

Table 11 shows the difference (in percent) between reference and sectoral approach CO_2 emissions.

Table 11: Difference (in %) of CO_2 emissions by type of fuel.

Year	Liquid	Solid	Gaseous	Total
1990	-0.32%	22.37%	7.48%	5.80%
1991	-0.54%	22.53%	7.55%	5.54%
1992	0.67%	30.39%	5.08%	5.84%
1993	-0.42%	32.10%	6.79%	5.79%
1994	-0.54%	35.65%	4.33%	5.48%
1995	0.48%	34.20%	4.15%	6.36%
1996	-0.11%	34.68%	3.99%	5.38%
1997	0.86%	35.22%	4.08%	6.50%
1998	0.91%	52.27%	3.86%	8.01%
1999	0.43%	46.60%	3.84%	7.26%
2000	-0.10%	44.60%	3.99%	7.56%
2001	0.19%	38.80%	3.54%	6.46%

Year	Liquid	Solid	Gaseous	Total
2002	-1.32%	42.89%	3.71%	5.87%
2003	-2.21%	34.33%	3.68%	3.92%
2004	-1.93%	35.06%	3.66%	3.86%
2005	-0.38%	40.13%	3.56%	5.53%
2006	0.84%	44.41%	3.94%	6.96%
2007	1.94%	47.82%	3.69%	7.83%
2008	2.00%	44.77%	3.88%	6.97%
2009	2.16%	46.86%	3.81%	5.52%
2010	3.49%	46.33%	4.01%	6.84%
2011	2.29%	45.09%	4.00%	6.17%

Positive numbers indicate that CO_2 emissions from the reference approach are higher than emissions from the sectoral approach.

3.8.1 Explanation of differences

Liquid Fuels: The energy balance is mass-balanced but not carbon balanced. The fuel category *Other Oil* is an aggregation of several fuel types and therefore it is difficult to quantify a reliable carbon emission factor for the reference approach. The reference approach takes a share of feedstock used for plastics and solvent production as non-carbon stored. In the sectoral approach emissions from waste incineration including plastics and waste oil are included in *Other Fuels*. Emissions from solvent use are included in category *3. Solvent and Other Products Use*. In the sectoral approach a share of municipal solid waste without energy recovery is considered in category *6.C.* for 1990 and 1991.

Diesel and Gasoline: In the Reference Approach CO_2 emissions from diesel and gasoline are fully accounted for as fossil emissions while in the sectoral approach the share of mixed biofuel is accounted for as biogenic.

Solid fuels: The reference approach includes process emissions from blast furnaces and steel production which are included in category *2.C. Metal Production* as well as process emissions from carbide production which are included in category *2.B.4. Carbide Production*. In the sectoral approach plant-specific CO_2 emission factors have been used for large coal boilers since 2005.

Gaseous fuels: Process emissions from ammonia production are included in category *2.B.1. Ammonia Production*.

Other fuels: The sectoral approach considers waste as an additional fuel type (e.g. municipal solid waste, hazardous waste and industrial fuel waste).

Carbon Stored: The reference approach uses IPCC default values for "fractions of carbon stored".

3.8.2 Quantification of differences

By quantifying the difference between the two approaches the remaining difference is between -0.6 to +2.9%. Currently it is not possible to quantify all fossil carbon flows such as solvents and plastic products which are imported or exported by products, bulk or waste.

Table 12 shows the differences that can be easily quantified. Positive numbers indicate CO_2 emissions not included in the sectoral approach. Negative numbers indicate CO_2 emissions which are not considered by the reference approach. The remaining differences are mainly due to the use of country-specific emission factors and NCVs within the sectoral approach and the use of "default fractions of carbon stored" within the reference approach.

Table 12: Quantification of differences.

Year	Natural Gas[1] [Gg CO_2]	2 B 1 Ammonia Production[3] [Gg CO_2]	Coke Oven Coke[4] [Gg CO_2]	Other Fuels [Gg CO_2]	Biofuels[5] [Gg CO_2]	Total [Gg CO_2]	Remaining difference[2]
1990	19	514	2 704	-732	0	2 505	1.1%
1991	17	540	2 722	-805	0	2 473	1.2%
1992	15	486	2 458	-956	0	2 002	2.0%
1993	14	534	2 526	-675	0	2 399	1.2%
1994	11	498	2 767	-820	0	2 457	0.8%
1995	13	537	3 136	-839	0	2 848	1.2%
1996	12	539	2 918	-1 073	0	2 396	1.3%
1997	10	532	3 316	-1 017	0	2 841	1.6%
1998	0	525	3 214	-818	0	2 921	2.9%
1999	2	533	3 077	-828	0	2 784	2.3%
2000	5	520	3 489	-834	0	3 180	2.0%
2001	3	475	3 449	-958	0	2 968	1.6%
2002	5	489	3 882	-1 163	0	3 212	0.7%
2003	5	529	3 723	-1 389	0	2 868	-0.2%
2004	4	529	3 652	-1 505	0	2 680	0.0%
2005	5	499	4 129	-1 374	125	3 384	0.7%
2006	5	536	4 208	-1 486	879	4 142	0.8%
2007	5	468	4 216	-1 430	1 010	4 267	1.1%
2008	5	526	4 187	-1 495	993	4 216	0.3%
2009	5	480	3 243	-1 690	1 568	3 607	-0.6%
2010	5	538	3 980	-1 797	1 662	4 387	-0.1%
2011	6	470	4 083	-1 930	1 634	4 262	-0.8%

[1] Distribution losses which are not considered in the sectoral approach.

[2] Negative numbers indicate that CO_2 emissions from the reference approach are lower than emissions from the sectoral approach.

[3] Process emissions of natural gas used for ammonia production.

[4] Process emissions of coke oven coke used in blast furnaces. Emissions are allocated to 2.C.1. Iron and Steel Production.

[5] Share of biofuel in diesel and gasoline.

4 ADDITIONAL REPORTING UNDER ARTICLE 3 OF DECISION 280/2004/EC

4.1 Article 3 (1) d

Austria decided not to make use of additional activities under Article 3(4) Kyoto Protocol, but reports the mandatory Article 3(3) activities. This includes emissions/removals from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation (since 1990).

Article 3.3 activities are a net sink in Austria: net CO_2 removals amounted to 1 287 Gg CO_2 equivalents in 2011 (Afforestation and Reforestation: -2 633 Gg CO_2 equivalents; Deforestation: 1 346 Gg CO_2 equivalents).

These figures are still preliminary and have a very high uncertainty, because the assessments of the C stock changes at the ARD areas in the Kyoto-period are running now and have therefore not been available for the estimates.

4.2 Article 3 (1) g

AAUs, RMUs, ERUs or CERs issued or transferred to the Austrian registry in the reporting period 2012 cannot be submitted together with this report as the current version of the union registry does not allow its generation. The SEF report (AT_Report_Art31g_2013.xls) will be provided as soon as the function is available.

4.3 Article 3 (1) h

Austria has authorised Kommunalkredit Public Consulting GmbH (Türkenstraße 9, 1092 Vienna) to participate in the mechanisms according to Article 6, 12 and 17 of the Kyoto Protocol.

4.4 Article 3 (1) j

Indicators pursuant to Article 3 (1) j of the Monitoring Decision are reported in Annex III. Emission data are consistent with the CRF; denominators are taken from official Austrian statistics.

4.5 Article 3 (1) k

The national inventory system is unchanged compared to the description given in chapter 3.3 and in the Austrian Initial Report under the Kyoto Protocol[27].

[27] http://unfccc.int/files/national_reports/initial_reports_under_the_kyoto_protocol/application/pdf/at-initial-report-200611-corr.pdf

ANNEX I: EMISSION TRENDS

This Annex presents emission trends for CO_2, CH_4, N_2O and FCs.

This report uses the following UNFCCC notation keys for all tables:

NE (not estimated) .....for existing emissions by sources and removals by sinks of greenhouse gases which have not been estimated.

IE (included elsewhere).....for emissions by sources and removals by sinks of greenhouse gases estimated but included elsewhere in the inventory instead of the expected source/sink category.

NO (not occurring).....for emissions by sources and removals by sinks of greenhouse gases that do not occur for a particular gas or source/sink category.

NA (not applicable).....for activities in a given source/sink category that do not result in emissions or removals of a specific gas.

C (confidential) .....for emissions which could lead to the disclosure of confidential information if reported at the most disaggregated level. In this case a minimum of aggregation is required to protect business information.

Table A.I-1:Emission Trends CO_2.

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011
Total Emissions/Removals with LULUCF	**52 091.43**	**52 404.88**	**50 997.00**	**72 390.15**	**75 508.68**	**73 810.38**	**74 355.31**	**63 807.87**	**69 023.08**	**66 913.30**
Total Emissions without LULUCF	**62 059.59**	**63 943.97**	**65 969.68**	**79 723.67**	**77 032.51**	**74 274.62**	**73 921.74**	**67 396.95**	**72 590.80**	**70 455.49**
1. Energy	**54 171.69**	**56 355.12**	**57 988.69**	**70 790.94**	**67 658.51**	**64 492.35**	**63 752.74**	**59 187.77**	**63 387.55**	**60 830.19**
A. Fuel Combustion (Sectoral Approach)	54 069.60	56 227.97	57 824.04	70 585.79	67 426.35	64 255.19	63 540.58	58 922.61	63 150.38	60 597.01
1. Energy Industries	13 792.28	12 918.64	12 221.05	16 274.39	15 159.57	13 885.09	13 672.64	12 740.11	14 105.13	13 861.09
2. Manufacturing Industries and Construction	12 685.38	13 489.03	13 861.46	16 363.64	16 097.25	15 841.54	15 932.21	14 340.21	15 291.93	14 827.78
3. Transport	13 771.40	15 675.07	18 620.84	24 679.12	23 402.81	23 576.88	22 322.82	21 516.93	22 204.20	21 523.38
4. Other Sectors	13 785.55	14 112.67	13 079.89	13 225.07	12 722.66	10 907.06	11 567.74	10 279.66	11 502.84	10 337.93
5. Other	35.00	32.55	40.80	43.57	44.06	44.61	45.17	45.70	46.27	46.83
B. Fugitive Emissions from Fuels	102.09	127.15	164.65	205.15	232.16	237.16	212.16	265.16	237.17	233.17
1. Solid Fuels	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO
2. Oil and Natural Gas	102.09	127.15	164.65	205.15	232.16	237.16	212.16	265.16	237.17	233.17
2. Industrial Processes	**7 581.71**	**7 387.93**	**7 776.11**	**8 707.48**	**9 113.12**	**9 546.07**	**9 952.23**	**8 051.65**	**9 024.34**	**9 450.09**
A. Mineral Products	3 274.18	2 862.55	2 965.71	3 132.87	3 306.72	3 517.56	3 531.12	2 915.82	2 935.73	3 029.59
B. Chemical Industry	582.56	583.54	589.70	559.25	593.00	525.08	593.32	539.08	607.80	631.56
C. Metal Production	3 724.96	3 941.84	4 220.70	5 015.35	5 213.40	5 503.43	5 827.79	4 596.75	5 480.81	5 788.94
D. Other Production	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
E. Production of Halocarbons and SF_6										
F. Consumption of Halocarbons and SF_6										
G. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3. Solvent and Other Product Use	**279.30**	**189.95**	**192.62**	**212.99**	**250.73**	**228.07**	**210.69**	**153.46**	**176.89**	**173.19**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011
4. Agriculture										
A. Enteric Fermentation										
B. Manure Management										
C. Rice Cultivation										
D. Agricultural Soils [(2)]										
E. Prescribed Burning of Savannas										
F. Field Burning of Agricultural Residues										
G. Other										
5. Land Use, Land-Use Change and Forestry	**-9 968.16**	**-11 539.09**	**-14 972.68**	**-7 333.52**	**-1 523.82**	**-464.24**	**433.57**	**-3 589.07**	**-3 567.72**	**-3 542.18**
A. Forest Land	-11 862.92	-13 143.37	-16 452.00	-9 148.49	-3 333.89	-2 305.75	-1 410.95	-5 459.25	-5 411.09	-5 362.94
B. Cropland	198.19	249.23	288.61	398.40	408.41	439.75	461.38	519.66	509.72	513.30
C. Grassland	353.68	149.32	198.99	400.67	399.63	401.25	399.96	375.73	368.75	362.92
D. Wetlands	191.08	241.34	285.56	329.47	332.01	346.88	345.94	347.46	355.78	353.61
E. Settlements	286.26	217.76	100.61	261.80	262.33	262.87	263.40	266.04	261.90	257.76
F. Other Land	865.55	746.64	605.55	424.62	407.69	390.76	373.83	361.28	347.22	333.16
G. Other	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
6. Waste	**26.89**	**10.97**	**12.26**	**12.26**	**10.15**	**8.12**	**6.09**	**4.06**	**2.03**	**2.03**
A. Solid Waste Disposal on Land	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
B. Waste-water Handling										
C. Waste Incineration	26.89	10.97	12.26	12.26	10.15	8.12	6.09	4.06	2.03	2.03
D. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011
7. Other *(please specify)*	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Memo Items:										
International Bunkers	**924.70**	**1 375.60**	**1 752.24**	**2 021.80**	**2 100.87**	**2 231.18**	**2 232.59**	**1 935.67**	**2 100.06**	**2 212.86**
Aviation	885.97	1 327.42	1 695.58	1 959.83	2 048.88	2 175.79	2 181.97	1 893.40	2 049.55	2 168.44
Marine	38.72	48.17	56.66	61.97	51.99	55.38	50.62	42.27	50.51	44.43
Multilateral Operations	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
CO_2 Emissions from Biomass	9 903.46	11 422.77	12 442.81	16 512.26	17 494.88	19 316.51	20 783.19	21 222.76	23 946.87	23 264.14

Table A.I-2: Emission Trends CH_4.

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011
Total Emissions/ Removals with LULUCF	**395.46**	**362.76**	**315.38**	**289.69**	**283.90**	**278.63**	**271.70**	**267.85**	**263.63**	**255.33**
Total Emissions without LULUCF	**395.43**	**362.75**	**315.38**	**289.68**	**283.89**	**278.63**	**271.69**	**267.84**	**263.62**	**255.32**
1. Energy	**31.90**	**31.14**	**25.08**	**23.68**	**22.79**	**22.30**	**22.27**	**22.05**	**23.46**	**22.06**
A. Fuel Combustion (Sectoral Approach)	21.97	20.39	15.05	13.24	12.07	11.45	11.57	10.92	11.94	10.64
1. Energy Industries	0.16	0.16	0.16	0.26	0.29	0.30	0.32	0.36	0.40	0.43
2. Manufacturing Industries and Construction	0.34	0.40	0.44	0.61	0.62	0.62	0.66	0.64	0.68	0.71
3. Transport	3.07	3.08	1.92	1.33	1.16	1.02	0.86	0.77	0.71	0.64
4. Other Sectors	18.40	16.75	12.53	11.03	10.00	9.51	9.74	9.15	10.15	8.86
5. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B. Fugitive Emissions from Fuels	9.93	10.75	10.03	10.44	10.72	10.85	10.70	11.13	11.52	11.42
1. Solid Fuels	0.52	0.28	0.27	0.00	0.00	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO
2. Oil and Natural Gas	9.41	10.47	9.76	10.44	10.71	10.85	10.70	11.13	11.52	11.42
2. Industrial Processes	**0.71**	**0.69**	**0.70**	**0.75**	**0.92**	**0.91**	**0.89**	**0.85**	**0.87**	**0.88**
A. Mineral Products	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B. Chemical Industry	0.70	0.68	0.70	0.75	0.92	0.90	0.88	0.84	0.87	0.87
C. Metal Production	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Other Production										
E. Production of Halocarbons and SF_6										
F. Consumption of Halocarbons and SF_6										
G. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3. Solvent and Other Product Use										

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011
4. Agriculture	**199.63**	**192.07**	**180.63**	**170.27**	**169.63**	**170.34**	**169.67**	**171.78**	**171.33**	**169.04**
A. Enteric Fermentation	178.73	172.08	162.71	153.74	153.23	153.84	153.52	155.49	155.06	153.08
B. Manure Management	20.52	19.50	17.42	16.12	15.94	16.03	15.70	15.83	15.78	15.49
C. Rice Cultivation	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Agricultural Soils [(2)]	0.33	0.44	0.45	0.37	0.41	0.42	0.41	0.42	0.46	0.44
E. Prescribed Burning of Savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field Burning of Agricultural Residues	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04	0.03
G. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Land Use, Land-Use Change and Forestry	**0.03**	**0.00**	**0.01**	**0.00**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**	**0.01**
A. Forest Land	0.03	0.00	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.01
B. Cropland	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
C. Grassland	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Wetlands	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Settlements	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
F. Other Land	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
G. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6. Waste	**163.20**	**138.86**	**108.97**	**94.98**	**90.55**	**85.08**	**78.86**	**73.17**	**67.96**	**63.34**
A. Solid Waste Disposal on Land	157.82	133.61	105.05	91.00	86.63	81.16	75.05	69.43	64.29	59.66
B. Waste-water Handling	4.85	4.21	2.68	1.64	1.48	1.39	1.30	1.20	1.11	1.11
C. Waste Incineration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Other	0.52	1.04	1.24	2.33	2.44	2.52	2.51	2.53	2.57	2.57

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011
7. Other *(please specify)*	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Memo Items:										
International Bunkers	**0.02**	**0.02**	**0.03**	**0.04**	**0.04**	**0.05**	**0.05**	**0.04**	**0.04**	**0.05**
Aviation	0.01	0.02	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.05
Marine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Multilateral Operations	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
CO_2 Emissions from Biomass										

Table A.I-3: Emission Trends N_2O.

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011
Total Emissions/ Removals with LULUCF	**20.13**	**21.44**	**20.41**	**17.69**	**17.81**	**17.91**	**18.52**	**17.62**	**16.88**	**17.24**
Total Emissions without LULUCF	**19.99**	**21.31**	**20.29**	**17.57**	**17.68**	**17.77**	**18.37**	**17.46**	**16.72**	**17.08**
1. Energy	**1.79**	**2.13**	**2.36**	**2.66**	**2.56**	**2.50**	**2.43**	**2.28**	**2.35**	**2.23**
A. Fuel Combustion (Sectoral Approach)	1.79	2.13	2.36	2.66	2.56	2.50	2.43	2.28	2.35	2.23
1. Energy Industries	0.15	0.16	0.16	0.27	0.29	0.31	0.33	0.32	0.39	0.38
2. Manufacturing Industries and Construction	0.26	0.32	0.43	0.50	0.51	0.52	0.52	0.48	0.50	0.50
3. Transport	0.62	0.87	0.98	1.08	1.00	0.95	0.85	0.79	0.75	0.69
4. Other Sectors	0.76	0.78	0.78	0.81	0.76	0.72	0.73	0.68	0.71	0.66
5. Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B. Fugitive Emissions from Fuels	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA
1. Solid Fuels	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA
2. Oil and Natural Gas	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA	IE,NA
2. Industrial Processes	**2.94**	**2.77**	**3.07**	**0.88**	**0.90**	**0.87**	**1.05**	**0.53**	**0.20**	**0.15**
A. Mineral Products	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
B. Chemical Industry	2.94	2.77	3.07	0.88	0.90	0.87	1.05	0.53	0.20	0.15
C. Metal Production	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
D. Other Production										
E. Production of Halocarbons and SF_6										
F. Consumption of Halocarbons and SF_6										
G. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3. Solvent and Other Product Use	**0.75**	**0.75**	**0.75**	**0.56**	**0.53**	**0.52**	**0.51**	**0.47**	**0.48**	**0.49**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011
4. Agriculture	**14.08**	**15.12**	**13.28**	**12.38**	**12.54**	**12.71**	**13.20**	**12.99**	**12.48**	**12.99**
A. Enteric Fermentation										
B. Manure Management	3.01	3.08	2.98	2.93	2.93	2.96	2.97	3.00	3.02	2.98
C. Rice Cultivation										
D. Agricultural Soils [(2)]	11.06	12.04	10.30	9.45	9.61	9.75	10.23	9.99	9.46	10.01
E. Prescribed Burning of Savannas	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
F. Field Burning of Agricultural Residues	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Land Use, Land-Use Change and Forestry	**0.13**	**0.13**	**0.12**	**0.12**	**0.12**	**0.14**	**0.15**	**0.16**	**0.16**	**0.16**
A. Forest Land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B. Cropland	0.13	0.13	0.12	0.12	0.12	0.14	0.15	0.16	0.16	0.16
C. Grassland	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Wetlands	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
E. Settlements	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
F. Other Land	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
G. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6. Waste	**0.43**	**0.55**	**0.83**	**1.09**	**1.15**	**1.18**	**1.19**	**1.20**	**1.21**	**1.21**
A. Solid Waste Disposal on Land										
B. Waste-water Handling	0.35	0.40	0.66	0.77	0.81	0.83	0.84	0.85	0.85	0.86
C. Waste Incineration	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D. Other	0.08	0.14	0.17	0.32	0.34	0.35	0.35	0.35	0.35	0.36

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011
7. Other *(please specify)*	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Memo Items:										
International Bunkers	**0.04**	**0.06**	**0.08**	**0.09**	**0.09**	**0.09**	**0.09**	**0.08**	**0.09**	**0.09**
Aviation	0.03	0.05	0.06	0.07	0.07	0.07	0.07	0.06	0.07	0.07
Marine	0.01	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Multilateral Operations	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
CO_2 Emissions from Biomass										

Table A.I-4: Emission Trends HFCs, PFCs and SF_6.

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011
Emissions of HFCs – Gg CO_2 equivalent	**22.55**	**339.64**	**646.82**	**997.37**	**1 004.15**	**1 042.65**	**1 082.02**	**1 134.26**	**1 285.65**	**1 349.01**
HFC-23 (Gg)	NA,NO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-32 (Gg)	NA,NO	0.00	0.01	0.02	0.02	0.02	0.03	0.03	0.04	0.05
HFC-41 (Gg)	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
HFC-43-10mee (Gg)	0.00	0.00	0.00	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
HFC-125 (Gg)	NA,NO	0.00	0.03	0.07	0.08	0.08	0.09	0.10	0.12	0.13
HFC-134 (Gg)	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
HFC-134a (Gg)	0.02	0.23	0.30	0.41	0.38	0.39	0.40	0.39	0.43	0.45
HFC-152a (Gg)	NA,NO	0.08	0.60	0.20	0.25	0.25	0.09	0.13	0.13	NA,NO
HFC-143 (Gg)	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
HFC-143a (Gg)	NA,NO	0.00	0.02	0.06	0.06	0.07	0.07	0.08	0.09	0.09
HFC-227ea (Gg)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HFC-236fa (Gg)	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
HFC-245ca (Gg)	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
Unspecified mix of listed HFCs (Gg CO_2 equivalent)	1.93	8.53	3.85	3.98	5.03	7.07	7.39	1.71	1.62	1.63
Emissions of PFCs (Gg CO_2 equivalent)	**1 079.24**	**68.39**	**67.46**	**125.04**	**136.94**	**183.72**	**167.13**	**28.64**	**63.93**	**60.07**
CF_4 (Gg)	0.14	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO
C_2F_6 (Gg)	0.02	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO
C_3F_8 (Gg)	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	0.00	0.00	0.00	IE,NA,NO	IE,NA,NO	IE,NA,NO
C_4F_{10} (Gg)	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
c-C_4F_8 (Gg)	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO	IE,NA,NO
C_5F_{12} (Gg)	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
C_6F_{14} (Gg)	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO	NA,NO
Unspecified mix of listed PFCs (Gg CO_2 equivalent)	29.05	68.39	67.46	125.04	135.50	182.55	166.39	28.64	63.93	60.07
Emissions of SF_6 (Gg CO_2 equivalent)	**493.37**	**1 153.20**	**602.25**	**517.12**	**474.88**	**384.22**	**390.87**	**357.54**	**351.50**	**321.53**
SF_6 (Gg)	0.02	0.05	0.03	0.02	0.02	0.02	0.02	0.01	0.01	0.01

ANNEX II: TIER 1 UNCERTAINTY ASSESSMENT

This Annex presents activity data and emission factor uncertainty and/or uncertainty of the emission estimate (”combined uncertainty”) for key sources of the Austrian GHG inventory, based on the key source assessment of the 2011 submission. Sources of uncertainties are explained in the NIR 2012. The key source analysis of the 2013 submission will be presented in the NIR 2013[28].

Table A.II: Uncertainties for Key Sources of the Austrian GHG Inventory (KS Assessment 2012).

IPCC Source category	Gas	AD	EF	Combined	Combined as % of total national emissions in 2010	Introduced into the trend in total national emissions
		Uncertainty [%]				
1 A 1 a gaseous: Public Electricity and Heat Production	CO_2	2.0	0.5	2.1	0.13	0.20
1 A 1 a liquid: Public Electricity and Heat Production	CO_2	0.5	0.5	0.7	0.01	0.01
1.A 1.a other: Public Electricity and Heat Production	CO_2	10.0	20.0	22.4	0.23	0.24
1.A 1.a solid: Public Electricity and Heat Production	CO_2	0.5	0.5	0.7	0.03	0.04
1.A 1 b gaseous: Petroleum refining	CO_2	2.0	0.5	2.1	0.01	0.02
1 A 1 b liquid: Petroleum refining	CO_2	0.5	0.5	0.7	0.02	0.02
1 A 1.c gaseous: Manufacture of Solid fuels and Other Energy Industries	CO_2	2.0	0.5	2.1	0.02	0.03
1 A 2 gaseous: Manufacturing Industries and Construction	CO_2	5.0	0.5	5.0	0.42	0.64
1 A 2 mobile-liquid: Manufacturing Industries and Construction	CO_2	3.0	0.5	3.0	0.04	0.06
1 A 2 other: Manufacturing Industries and Construction	CO_2	10.0	20.0	22.4	0.21	0.20
1 A 2 solid: Manufacturing Industries and Construction	CO_2	1.0	0.5	1.1	0.07	0.09
1 A 2 stat-liquid: Manufacturing Industries and Construction	CO_2	3.0	0.5	3.0	0.07	0.10
1 A 3 b diesel oil: Road Transportation	CO_2	3.0	3.0	4.2	0.85	1.01
1 A 3 b gasoline: Road Transportation	CO_2	3.0	3.0	4.2	0.27	0.33
1 A 3 e gaseous: Other	CO_2	2.0	0.5	2.1	0.01	0.01
1 A 4 biomass: Other Sectors	CH_4	10.0	50.0	51.0	0.13	0.10
1 A 4 gaseous: Other Sectors	CO_2	5.0	0.5	5.0	0.29	0.44
1 A 4 mobile-diesel: Other Sectors	CO_2	3.0	0.5	3.0	0.03	0.04

[28] Austria’s National Inventory Report 2013, submission under the United Nations Framework Convention on Climate Change (the NIR is due for reporting under the Monitoring Mechanism (280/2004/EC) by March 15 and will be reported under the UNFCCC by April 15 – it will be published in April).

IPCC Source category	Gas	AD	EF	Com-bined	Combined as % of total national emissions in 2010	Introduced into the trend in total national emissions
		Uncertainty [%]				
1 A 4 other: Other Sectors	CO_2	10.0	20.0	22.4	0.00	0.10
1 A 4 solid: Other Sectors	CO_2	1.0	0.5	1.1	0.00	0.02
1 A 4 stat-liquid: Other Sectors	CO_2	3.0	0.5	3.0	0.19	0.29
2.A.1: Cement Production	CO_2	1.1	2.0	2.3	0.05	0.04
2.A.2: Lime Production	CO_2	1.6	5.0	5.2	0.04	0.02
2.A.3: Limestone and Dolomite Use	CO_2	19.6	2.0	19.7	0.07	0.11
2.A.7.b: Sinter Production	CO_2	2.0	5.0	5.4	0.02	0.02
2.B.1: Ammonia Production	CO_2	2.0	4.6	5.0	0.03	0.02
2.B.2: Nitric Acid Production	N_2O	2.0	5.0	5.4	0.00	0.06
2.C.1: Iron and Steel Production	CO_2	0.5	0.5	0.7	0.05	0.05
2.C.3: Aluminium production	PFCs	2.0	50.0	50.0	0.00	0.76
2.C.4: SF6 Used in Al and Mg Foundries	SF_6	0.0	5.0	5.0	0.00	0.02
2.F.1/2/3/4./5: ODS Substitutes	HFC/ PFC	20.0	50.0	53.9	0.77	0.87
2.F.9: Other Sources of SF6	PFC/ SF_6	25.0	50.0	55.9	0.17	0.14
3: SOLVENT AND OTHER PRODUCT USE	CO_2	5.0	10.0	11.2	0.02	0.02
3: SOLVENT AND OTHER PRODUCT USE	N_2O	20.0	0.0	20.0	0.04	0.06
4.A.1: Cattle	CH_4	10.0	20.0	22.4	0.83	0.61
4.B.1: Cattle	CH_4	10.0	50.0	51.0	0.14	0.07
4.B.1: Cattle	N_2O	10.0	100.0	100.5	0.92	0.17
4.D.1: Direct Soil Emissions	N_2O	5.0	150.0	150.1	3.20	0.68
4.D.3: Indirect Emissions	N_2O	5.0	150.0	150.1	2.02	0.75
6.A: Solid Waste Disposal on Land	CH_4	12.0	25.0	27.7	0.46	0.80
6.B: Wastewater Handling	N_2O	20.0	50.0	53.9	0.17	0.14
Total					**4.24**	**2.34**

ANNEX III: INDICATORS

This Annex presents the indicators pursuant to Article 3 (1) j of the Monitoring Decision (280/2004/EC), a detailed description of the indicators can be found in Annex II of the "Implementing Provisions" (Commission Decision 2005/166/EC).

Information on all Priority Indicators (including Additional Priority Indicators) is provided; however, data for one Supplementary Indicator was not available (indicated by NA in the cells).[29]

Table A.III: Indicators pursuant to Article 3 (1) j of the Monitoring Decision for the years 1990, 1995, 2000, 2005–2011.

No	Indicator	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011
	Priority										
1	Total CO2 intensity of GDP [t CO2/Mio Euro]	358.5	330.9	292.3	325.1	303.0	281.7	276.4	261.9	276.4	260.9
2	Energy related CO_2 intensity of GDP [t CO_2/Mio Euro]	312.3	291.0	256.2	287.8	265.2	243.7	237.6	229.0	240.5	224.7
3	Specific CO_2 emissions of passenger cars [g CO_2/ km]	212.3	205.8	192.5	176.9	171.2	168.1	164.5	159.7	155.9	152.4
4	Energy related CO_2 intensity of industry [t/Mio Euro]	290.1	284.6	255.4	278.9	261.2	240.6	243.1	253.3	256.3	232.8
5	Specific CO_2 emissions of households [t CO_2/dwelling]	3.40	3.17	2.76	2.53	2.31	2.03	2.06	1.97	2.16	1.88
6	CO_2 intensity of the commercial and institutional sector [t CO_2/Mio Euro]	25.12	28.55	22.62	23.52	24.11	17.80	20.37	14.87	17.48	15.76
7	Specific CO_2 emissions of public and autoproducer power plants [t CO_2/TJ]	166.8	150.9	128.6	123.0	121.5	117.7	106.7	97.3	101.8	107.0
	Additional Priority										
1	Freight transport on road [g CO_2/ ton-km]	140.6	120.5	94.6	87.7	87.2	85.3	84.4	84.4	81.1	81.6
2	Total CO_2 intensity – iron and steel industry [t CO_2/Mio Euro]	2 651	3 193	2 525	3 490	3 657	3 468	3 659	3 565	4 604	3 977
3	Energy related CO_2 intensity – chemical industry [t CO_2/Mio Euro]	575.2	532.8	492.4	516.8	414.0	328.3	385.9	317.4	324.2	308.4

[29] The units of the transport indicators (No. 3 Priority Indicator, No. 1 Additional Priority Indicator, and No.1-3 Supplementary Indicator) were changed to the common unit g CO_2/km (the suggested unit was g CO_2/100 km). Furthermore, the names of the transport indicators No.3 and 4 Supplementary Indicator have been adapted to be consistent.

No	Indicator	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011
4	Energy related CO_2 intensity – glass, pottery and building materials industry [t CO_2/Mio Euro]	672.6	651.1	609.6	641.1	656.8	693.0	748.0	782.2	745.1	731.0
5	Specific CO_2 emissions of iron and steel industry [t CO_2/t production]	2.17	1.92	1.82	1.79	1.78	1.71	1.75	1.91	1.72	1.70
6	Specific energy related CO_2 emissions of cement industry [t CO_2/t production]	0.225	0.226	0.214	0.194	0.207	0.213	0.205	0.200	0.193	0.181
	Supplementary										
1	Specific diesel related CO_2 emissions of passenger cars [g CO_2/ km]	193.7	189.1	179.1	166.7	159.8	158.4	157.6	153.5	152.2	149.5
2	Specific petrol related CO_2 emissions of passenger cars [g CO_2/ km]	216.2	212.1	202.7	190.6	187.3	182.5	175.1	169.0	161.2	156.5
3	Passenger transport on road [g CO_2/passenger-km]	155.7	159.1	157.1	148.7	144.3	142.2	139.7	136.1	133.3	130.7
4	Passenger transport by air [kg CO_2/passenger]	234.0	226.1	125.8	110.8	110.7	108.8	98.8	96.0	81.6	93.3
5	Energy related CO_2 intensity – food, drink and tobacco industry [t CO_2/Mio Euro]	234.2	181.4	169.5	176.2	167.3	136.3	142.4	179.7	161.9	131.1
6	Energy related CO_2 intensity – paper and printing industry [t CO_2/Mio Euro]	864.7	803.4	653.9	618.6	550.4	512.9	533.7	532.2	554.5	522.4
7	Specific CO_2 emissions of households for space heating [t CO_2/m²]	33.84	30.32	25.42	22.71	20.49	17.87	18.13	17.19	18.72	16.23
8	Specific CO_2 emissions of commercial and institutional sector for space heating [kg CO_2/m²]	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	Specific CO_2 emissions of public power plants [t CO_2/TJ]	166.4	143.5	133.3	112.2	110.2	103.1	93.9	84.2	84.7	87.1
10	Specific CO_2 emissions of autoproducer plants [t CO_2/TJ]	168.2	168.2	117.6	161.5	157.2	158.2	145.7	138.6	156.5	166.8
11	Carbon intensity of total power generation [t CO_2/TJ]	68.37	59.04	48.19	59.28	57.43	53.87	49.09	42.72	49.60	53.37

No	Indicator	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011
12	Carbon intensity of transport [t CO_2/TJ]	65.94	64.06	63.61	65.06	62.51	61.71	60.36	60.12	60.25	59.99
13	Specific energy related CO_2 emissions of paper industry [t CO_2/t production]	0.755	0.643	0.536	0.465	0.424	0.421	0.427	0.448	0.433	0.415
14	Carbon intensity in Industry [kt CO_2 /PJ]	58.58	61.76	54.65	54.67	52.04	50.57	49.68	45.36	48.11	47.51
15	Carbon intensity Households [kt CO_2 /PJ]	40.92	37.51	34.86	31.56	30.10	28.01	27.93	26.87	27.24	26.31

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In "Austria's Annual Greenhouse Gas Inventory 1990–2011" the Umweltbundesamt presents updated figures of greenhouse gas (GHG) emissions in Austria. In 2011, the fourth year of the first commitment period under the Kyoto Protocol, GHG emissions amounted to 82.8 million tonnes of CO_2 equivalents. This corresponds to a 6.0% increase against the base-year level and to a 2.6% decrease compared to 2010. The key driver for the decrease from 2010 to 2011 was the decreasing consumption of fossil fuels due to mild temperatures and the high crude oil price.

Content and format of this report are in accordance with the obligations under the greenhouse gas monitoring mechanism 280/2004/EC for implementing the Kyoto Protocol. Updated emission data have to be reported yearly to the European Commission by 15 January at the latest.

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