ENVIRONMENT AGENCY AUSTRIA umweltbundesamt

Austria's Annual Greenhouse Gas Inventory 1990–2012

Submission under Regulation 525/2013/EC

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AUSTRIA'S ANNUAL GREENHOUSE GAS INVENTORY 1990–2012

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REPORT
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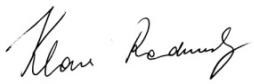
Date 15.01.2014	Responsible for the content of this report  Dr. Klaus Radunsky (Head of the inspection body)
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VORWORT

Dieser Bericht

Der vorliegende Bericht präsentiert die neuesten Daten der Treibhausgas(THG)-Emissionen Österreichs. Diese Daten betreffen die Emissionen des Jahres 2012 sowie die aktualisierte Zeitreihe der Jahre 1990 bis 2011.

Der Bericht folgt in Format und Inhalt den Anforderungen des THG-Überwachungssystems (Monitoring Mechanism), in Umsetzung von Artikel 7 der Verordnung Nr. 525/2013/EG[1] (soweit Umsetzungsbestimmungen vorhanden). Dieses System umfasst die jährliche Übermittlung von aktualisierten THG-Emissionsdaten sowie zusätzlicher Informationen (z. B. SEF, Indikatoren) und einem dazugehörigen Kurzbericht („Short-NIR") mit 15. Jänner an die Europäische Kommission (EK). Eine detaillierte Darstellung der Daten wird der Europäischen Kommission in digitaler Form übermittelt.

Rechtlicher Hintergrund

Als Vertragsstaat der Klimarahmenkonvention (*Rahmenübereinkommen der Vereinten Nationen über Klimaänderungen* (UN Framework Convention on Climate Change – UNFCCC, BGBl. Nr. 414/1994[2]) 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. Von 30. September bis 5. Oktober 2013 fand die letzte dieser Tiefenprüfungen der Österreichischen Treibhausgas-Inventur durch internationale Fachexperten statt. Die Ergebnisse dieser Prüfung werden im Frühjahr 2014 auf der Website der UNFCCC veröffentlicht[3]. Die im Rahmen der Inventurprüfung eingebrachten Verbesserungsvorschläge wurden bereits teilweise in der diesjährigen Inventur berücksichtigt, teilweise fließen sie in das Inventurverbesserungsprogramm 2014 ein (siehe Tabelle A).

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[1] Verordnung (EU) Nr. 525/2013 des Europäischen Parlaments und des Rates vom 21. Mai 2013 über ein System für die Überwachung von Treibhausgasemissionen sowie für die Berichterstattung über diese Emissionen und über andere klimaschutzrelevante Informationen auf Ebene der Mitgliedstaaten und der Union und zur Aufhebung der Entscheidung Nr. 280/2004/EG.
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:165:0013:0040:DE:PDF

[2] BGBl. Nr. 414/1994: Rahmenübereinkommen der Vereinten Nationen über Klimaänderungen samt Anlagen. Änderung durch BGBl. III Nr. 12/1999.
http://www.ris.bka.gv.at/Dokumente/BgblPdf/1994_414_0/1994_414_0.pdf
http://www.ris.bka.gv.at/Dokumente/BgblPdf/1999_12_3/1999_12_3.pdf

[3] Review of the annual submission of Austria submitted in 2013
http://unfccc.int/national_reports/annex_i_ghg_inventories/inventory_review_reports/items/6947.php

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

15. Jänner *(Jahr n)*	Übermittlung der THG Inventur an EK (CRF für die Jahre 1990 bis zum Jahr n-2)
15. Jänner bis 28. Februar *(Jahr n)*	Überprüfung der Daten durch die EK
15. März *(Jahr n)*	Übermittlung des (endgültigen) nationalen Inventurberichtes (NIR)
15. März bis 8. April *(Jahr n)*	Überprüfung der Daten (CRF) und des nationalen Inventurberichtes (NIR) durch die EK
15. April *(Jahr n)*	Übermittlung der THG Inventur (CRF und NIR) 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 Verbesserungsvorschläge 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[4] 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[5].

Der vorliegende Bericht wurde vom Umweltbundesamt auf Grundlage des Umweltkontrollgesetzes BGBl. Nr. 152/1998[6] 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.

[4] http://unfccc.int/kyoto_protocol/items/2830.php

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

[6] https://www.ris.bka.gv.at/Dokumente/BgblPdf/1998_152_1/1998_152_1.pdf

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 2013	15. Jänner 2014	Common Reporting Format (CRF)

ZUSAMMENFASSUNG

Die hier dargestellte Entwicklung der Treibhausgase in Österreich folgt in der Einteilung den Sektoren der Klimastrategie 2007.[7]

Die Treibhausgas-Inventur 2012 im Detail

Die Ergebnisse der Treibhausgas-Inventur für 2012 zeigen einen Rückgang der Treibhausgas-Emissionen: Im Jahr 2012 wurden in Österreich 80,2 Mio. Tonnen Kohlendioxid-Äquivalent emittiert. Gegenüber 2011 sind das um 3,3 % bzw. 2,7 Mio. Tonnen weniger. Im Vergleich zu 1990 liegen die Emissionen 2012 um 2,8 % bzw. 2,1 Mio. Tonnen darüber.

Industrie und Energieaufbringung

Der Sektor Industrie ist mit ca. 24,8 Mio. Tonnen Kohlendioxid-Äquivalent (CO_2-Äquivalent) im Jahr 2012 der größte Treibhausgas-Emittent in Österreich. Gegenüber 2011 sind die Emissionen um ca. 0,5 Mio. Tonnen gesunken. Während die geringere Produktion in der Eisen- und Stahlindustrie zu einer Reduktion der Emissionen bei den Emissionshandelsbetrieben (− 2,5 %) führte, blieben die Treibhausgas-Emissionen (THG-Emissionen) aus dem Nicht-Emissionshandelsbereich dieses Sektors im Vergleich zu 2011 annähernd konstant. Insgesamt sind die THG-Emissionen dieses Sektors seit 1990 um 16,8 % gestiegen.

Im Sektor Energieaufbringung wurden 2012 mit 12,4 Mio. Tonnen Kohlendioxid-Äquivalent um ca. 10,1 % (− 1,4 Mio. Tonnen) weniger emittiert als 2011. Bei den Anlagen, die im Emissionshandel erfasst sind, gingen die THG-Emissionen 2012 um 14,9 % (− 1,7 Mio. Tonnen) zurück. Ausschlaggebend dafür war insbesondere die Stromerzeugung aus Wasserkraft, die mit einem Plus von 28 % im Jahr 2012 einen historischen Höchststand erreichte. Hingegen sind im Nicht-Emissionshandelsbereich die THG-Emissionen vor allem durch den verstärkten Einsatz von Erdgas gegenüber 2011 um 14,2 % (+ 0,3 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 Energieträgern in der Strom- und Wärmeproduktion deutlich bemerkbar: seit 1990 ist die Inlandstromproduktion um 39 % gestiegen, die THG-Emissionen aus der Energieaufbringung hingegen um rd. 10 % gesunken.

Verkehr

Die THG-Emissionen im Sektor Verkehr betrugen im Jahr 2012 ca. 21,7 Mio. Tonnen CO_2-Äquivalent, das sind um 0,1 Mio. Tonnen (− 0,5 %) weniger im Vergleich zu 2011. Die Emissionsabnahme ist auf den Rückgang des Kraftstoffabsatzes aufgrund hoher Kraftstoffpreise, der schleppenden Erholung der Konjunktur und auf Effizienzsteigerungen beim spezifischen Verbrauch der Flotte zurückzuführen. Durch den Einsatz von Biokraftstoffen konnten im Jahr 2012 ca. 1,7 Mio. Tonnen Kohlendioxid-Äquivalent eingespart werden. Seit 1990 verzeichnet der Sektor Verkehr eine Emissionszunahme von 54 % im Wesentlichen bedingt durch den Anstieg der Fahrleistung im Straßenverkehr.

[7] 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).

Raumwärme & Kleinverbrauch

Auf den Sektor Raumwärme & Kleinverbrauch entfielen 2012 ca. 9,5 Mio. Tonnen CO_2-Äquivalent. Das entspricht einem Rückgang um 6,6 % gegenüber 2011. Langfristig führten der verstärkte Einsatz von Fernwärme und Erneuerbaren Energieträgern sowie die bessere thermische Qualität der Gebäude zu einem deutlichen Rückgang der THG-Emissionen in diesem Sektor (− 34,1 % seit 1990).

Landwirtschaft

In der Landwirtschaft wurden im Jahr 2012 ca. 7,5 Mio. Tonnen Treibhausgase emittiert und damit um 1 % weniger als im Jahr 2011. Seit 1990 sind die THG-Emissionen um 12,4 % (− 1,1 Mio. Tonnen) zurückgegangen. Dies ist auf den rückläufigen Viehbestand sowie den effizienteren Einsatz von Stickstoffdünger zurückzuführen.

Abfallwirtschaft

2012 wurden im Sektor Abfallwirtschaft 1,7 Mio. Tonnen CO_2-Äquivalent emittiert. Dies entspricht einem Rückgang um 4,6 % (− 0,1 Mio. Tonnen) gegenüber dem Vorjahr. Gegenüber 1990 haben sich die Emissionen um 53,8 % (− 1,9 Mio. Tonnen) verringert. Neben der verstärkten Abfalltrennung, Wiederverwendung und dem Recycling sind die Deponiegaserfassung und die verstärkte thermische und mechanisch-biologische Behandlung von Siedlungsabfällen für diese Abnahme verantwortlich.

F-Gase und Sonstige

2012 wurden F-Gase im Ausmaß von 1,8 Mio. Tonnen CO_2-Äquivalent emittiert. Der Anstieg beträgt + 3,9 % gegenüber dem Vorjahr bzw. + 16.9 % gegenüber 1990. Dieser Anstieg ist vor allem auf den verstärkten Einsatz von HFKWs als Kältemittel zurückzuführen.

Der Sektor „Sonstige“, insgesamt 0,8 Mio. Tonnen Kohlendioxid-Äquivalent im Jahr 2012, umfasst Lösemittelemissionen und flüchtige Emissionen aus der Energieträgerförderung und -verteilung. Die Emissionen sind seit 1990 weitgehend konstant (– 1,6 %).

Neubewaldung und Entwaldung (Art. 3.3 Kyoto-Protokoll)

Die Bilanz aus Neubewaldung und Entwaldung wurde auf Basis einer detaillierten Erhebung für die Treibhausgas-Inventur 2012 ermittelt. Daraus resultieren rd. 6,8 Mio. Tonnen Kohlendioxid-Äquivalent, die über die Kyoto-Verpflichtungsperiode 2008–2012 als Senke angerechnet werden.

1 INTRODUCTION

This report covers the Austrian greenhouse gas (GHG) inventory data for the years 1990 to 2012; it presents the greenhouse gas emission data for the whole 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 7 of Regulation No. 525/2013/EC[8] ("Monitoring Mechanism Regulation"; MMR) repealing Decision No. 280/2004/EC[9] ("Monitoring Mechanism Decision"; MMD) 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[10] 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)[11], 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*[12], the *Intergovernmental Panel on Climate Change (IPCC) Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*[13], and the *IPCC Good Practice Guidance for Land Use, Land-Use Change and Forestry*[14] as well as the Reporting Guidelines[15] established by the Conference of the Parties to the UNFCCC and under the Kyoto Protocol.

The national greenhouse gas inventory has to be submitted to the European Commission (EC) 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 Union greenhouse gas inventory report (Article 7 (1) p of 525/2013/EC). The elements of the so-called "Short-NIR" are based on Article 4 of the Implementing Provisions to 280/2004/EC (Commission Decision 2005/166/EC)[16]. An Implementing Act specifying the reporting pursuant to 525/2013/EC is currently under preparation. The reporting will be extended accordingly as soon as these are adopted.

The content of this report covers to a large extent the requirements as stipulated in Table 1.

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[8] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2013:165:0013:0040:EN:PDF

[9] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:049:0001:0001:EN:PDF

[10] http://ozone.unep.org/new_site/en/Treaties/treaty_text.php?treatyID=2

[11] http://unfccc.int/essential_background/convention/items/6036.php

[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] Updated UNFCCC reporting guidelines on annual inventories following incorporation of the provisions of decision 14/CP.11. FCCC/SBSTA/2006/9

http://unfccc.int/resource/docs/2006/sbsta/eng/09.pdf

[16] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:055:0057:0057:EN:PDF

Table 1: Regulation No. 525/2013/EC ("Monitoring Mechanism Regulation", MMR), Article 7.

Regulation No. 525/2013/EC 'Monitoring Mechanism Regulation', MMR Article 7 Greenhouse gas inventories		**Decision No. 280/2004/EC MMD**	**Implemented in Austria's annual GHG inventory 1990–2012; Submission under Regulation 525/2013/EC**
(1)	By 15 January each year (year X), Member States shall determine and report the following to the Commission:		
a)	their anthropogenic emissions of greenhouse gases listed in Annex I to this Regulation and the anthropogenic emissions of greenhouse gases referred to in Article 2(1) of Decision No 406/2009/EC for the year X-2, in accordance with UNFCCC reporting requirements.	3 1 (b)	See Table 2
	Without prejudice to the reporting of the greenhouse gases listed in Annex I to this Regulation, the CO_2 emissions from IPCC source category '1.A.3.A civil aviation' shall be considered equal to zero for the purposes of Article 3 and Article 7(1) of Decision No 406/ 2009/EC;		Not reported as not yet required under UNFCCC
b)	data in accordance with UNFCCC reporting requirements on their anthropogenic emissions of carbon monoxide (CO), sulphur dioxide (SO_2), nitrogen oxides (NO_x) and volatile organic compounds, consistent with data already reported pursuant to Article 7 of Directive 2001/81/EC and the UNECE Convention on Long-Range Transboundary Pollution, for the year X-2;	3 1 (d)	Reported in respective SECTORAL REPORTs and SUMMARY 1.A & 1.B of the CRF tables
c)	their anthropogenic greenhouse gas emissions by sources and removals of CO_2 by sinks resulting from LULUCF, for the year X-2, in accordance with UNFCCC reporting requirements;		Reported in CRF Table 5 Sectoral Report for Land Use, Land-Use Change and Forestry
d)	their anthropogenic greenhouse gas emissions by sources and removals of CO_2 by sinks resulting from LULUCF activities pursuant to Decision No 529/2013/EU and the Kyoto Protocol and information on the accounting of these greenhouse gas emissions and removals from LULUCF activities, in accordance with Decision No 529/2013/EU and with Article 3(3) and (4) of the Kyoto Protocol, and relevant decisions thereunder, for the years between 2008 or other applicable years and the year X-2. Where Member States account for cropland management, grazing land management, revegetation or wetland drainage and rewetting, they shall in addition report greenhouse gas emissions by sources and removals by sinks for each such activity for the relevant base year or period specified in Annex VI to Decision No 529/2013/EU and in the Annex to Decision 13/CMP.1. In complying with their reporting obligations pursuant to this point, and in particular when submitting information on emissions and removals relating to their accounting obligations set out in Decision No 529/2013/EU, Member States shall submit information taking fully into account applicable IPCC good practice guidance for LULUCF;		Not yet relevant

Regulation No. 525/2013/EC 'Monitoring Mechanism Regulation', MMR Article 7 Greenhouse gas inventories		Decision No. 280/2004/EC MMD	Implemented in Austria's annual GHG inventory 1990–2012; Submission under Regulation 525/2013/EC
e)	any changes to the information referred to in points (a) to (d) for the years between the relevant base year or period and the year X-3, indicating the reasons for these changes;	3 1 (e)	reasons for recalculations presented in Chapter 3.5.1 to 3.5.7
f)	information on indicators, as set out in Annex III, for the year X-2;	3 1 (j)	See Chapter 5.1 and file AT_Annex II_indicators_2014.xls
g)	information from their national registry on the issue, acquisition, holding, transfer, cancellation, retirement and carry-over of AAUs, RMUs, ERUs, CERs, tCERs and lCERs for the year X-1;	3 1 (g)	See Chapter 5.2 and file SEF_AT_2014_1_14-10-56 13-1-2014.xls
h)	summary information on concluded transfers pursuant to Article 3(4) and (5) of Decision No 406/2009/EC, for the year X-1;		Not yet relevant See Chapter 5.3
i)	information on the use of joint implementation, of the CDM and of international emissions trading, pursuant to Articles 6, 12 and 17 of the Kyoto Protocol, or any other flexible mechanism provided for in other instruments adopted by the Conference of the Parties to the UNFCCC or the Conference of the Parties to the UNFCCC serving as the meeting of the Parties to the Kyoto Protocol, to meet their quantified emission limitation or reduction commitments pursuant to Article 2 of Decision 2002/358/EC and the Kyoto Protocol or any future commitments under the UNFCCC or the Kyoto Protocol, for the year X-2;		See Chapter 5.4
j)	information on the steps taken to improve inventory estimates, in particular in areas of the inventory that have been subject to adjustments or recommendations following expert reviews;	3 1 (i)	Improvements made in response to the ERT are presented in Chapter 3.5.8
k)	the actual or estimated allocation of the verified emissions reported by installations and operators under Directive 2003/87/EC to the source categories of the national greenhouse gas inventory, where possible, and the ratio of those verified emissions to the total reported greenhouse gas emissions in those source categories, for the year X-2;		Decision 166/2005 does not have any provisions on this issue; the new implementing act is not yet adopted. However, a description regarding allocation of the verified emissions under ETS is already presented in the NIR 2013, Chapter 3.2.9.1 and Table 30 and will be updated for NIR 2014.
l)	where relevant, the results of the checks performed on the consistency of the emissions reported in the greenhouse gas inventories, for the year X-2, with the verified emissions reported under Directive 2003/87/EC;		Decision 166/2005 does not have any provisions on this issue; the new implementing act is not yet adopted. However, a description regarding checks performed on the consistency of the emissions reported in the greenhouse gas inventories is already presented in the NIR 2013, Chapter 3.2.9.1 and will be updated for NIR 2014.

Regulation No. 525/2013/EC 'Monitoring Mechanism Regulation', MMR Article 7 Greenhouse gas inventories		**Decision No. 280/2004/EC MMD**	**Implemented in Austria's annual GHG inventory 1990–2012; Submission under Regulation 525/2013/EC**
m)	where relevant, the results of the checks performed on the consistency of the data used to estimate emissions in preparation of the greenhouse gas inventories, for the year X-2, with:		Decision 166/2005 does not have any provisions on this issue; the new implementing act is not yet adopted.
i)	the data used to prepare inventories of air pollutants under Directive 2001/81/EC;		Regarding inventory preparation see chapter 3. As in Austria emissions of GHG are estimated together with emissions of air pollutants in a database checks are performed and discussed under the report of the NEC directive and Austria's Informative Inventory Report (IIR).
ii)	the data reported pursuant to Article 6(1) of Regulation (EC) No 842/2006;		A description regarding checks performed on the consistency of reported data and the greenhouse gas inventories is included in the NIR 2013, Chapter 4.5 and will be updated for NIR 2014.
iii)	the energy data reported pursuant to Article 4 of, and Annex B to, Regulation (EC) No 1099/2008;		A description regarding checks related to the energy balance is already presented in the Annex 2 of the NIR 2013 and will be updated for NIR 2014.
n)	a description of changes to their national inventory system;	3 1 (h)	See Chapter 3.3
o)	a description of changes to the national registry;		See Chapter 5.6
p)	information on their quality assurance and quality control plans, a general uncertainty assessment, a general assessment of completeness and, where available, other elements of the national greenhouse gas inventory report needed to prepare the Union greenhouse gas inventory report.	3 1 (f)	See for QA/QC: Chapter 3.6 UA: Chapter 3.7 Completeness: Chapter 3.2
In the first reporting year under this Regulation, Member States shall inform the Commission of any intention to make use of Article 3(4) and (5) of Decision No 406/2009/EC.			See Chapter 5.7

Table 2: Comparison of reporting requirements regarding anthropogenic emissions of GHG listed in Annex I Regulation No. 525/2013/EC and Decision No. 280/2004/EC, Article 3.1(a).

	Regulation No. 525/2013/EC (MMR)	**Decision No. 280/2004/EC (MMD)**
Carbondioxide (CO_2)	X	X
Methane (CH_4)	X	X
Nitrous Oxide (N_2O)	X	X
Sulphurhexafluoride (SF_6)	X	X
Nitrogentrifluoride (NF_3)	Not reported as not yet required under UNFCCC	
Hydrofluorocarbons (HFC_s):		X
HFC-23 CHF_3	X	X
HFC-32 CH_2F_2	X	X
HFC-41 CH_3F	X	X
HFC-125 CHF_2CF_3	X	X
HFC-134 CHF_2CHF_2	X	X
HFC-134a CH_2FCF_3	X	X
HFC-143 CH_2FCHF_2	X	X
HFC-143a CH_3CF_3	X	X
HFC-152 CH_2FCH_2F	Not reported as not yet required under UNFCCC	
HFC-152a CH_3CHF_2	X	X
HFC-161 CH_3CH_2F	Not reported as not yet required under UNFCCC	
HFC-227ea CF_3CHFCF_3	X	X
HFC-236cb $CF_3CF_2CH_2F$	Not reported as not yet required under UNFCCC	
HFC-236ea $CF_3CHFCHF_2$	Not reported as not yet required under UNFCCC	
HFC-236fa $CF_3CH_2CF_3$	X	X
HFC-245fa $CHF_2CH_2CF_3$	Not reported as not yet required under UNFCCC	
HFC-245ca $CH_2FCF_2CHF_2$	X	X
HFC-365mfc $CH_3CF_2CH_2CF_3$	Not reported as not yet required under UNFCCC	
HFC-43-10mee $CF_3CHFCHFCF_2CF_3$ or ($C_5H_2F_{10}$)	x	x
Perfluorocarbons (PFCs):	X	X
PFC-14, Perfluoromethane, CF_4	X	X
PFC-116, Perfluoroethane, $C2F_6$	X	X
PFC-218, Perfluoropropane, $C3F_8$	X	X
PFC-318, Perfluorocyclobutane, c-C_4F_8	X	X
Perfluorocyclopropane, c-C_3F_6	Not reported as not yet required under UNFCCC	
PFC-3-1-10, Perfluorobutane, C4F10	X	X
PFC-4-1-12, Perfluoropentane,C5F12	X	X
PFC-5-1-14, Perfluorohexane, C_6F_{14}	X	X
PFC-9-1-18, $C_{10}F_{18}$	Not reported as not yet required under UNFCCC	

2 EMISSION TRENDS

Under the 'burden sharing agreement' of the European Union[17], 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 IPCC 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 2012 Austria's total greenhouse gas emissions (without LULUCF) amounted to 80.2 million tonnes CO_2 equivalents (CO_2e). Compared to the base year 1990 emissions increased by 2.8% and compared to 2011, emissions decreased by 3.3%. The trend is dominated by the trend of the most important sector – the energy sector.

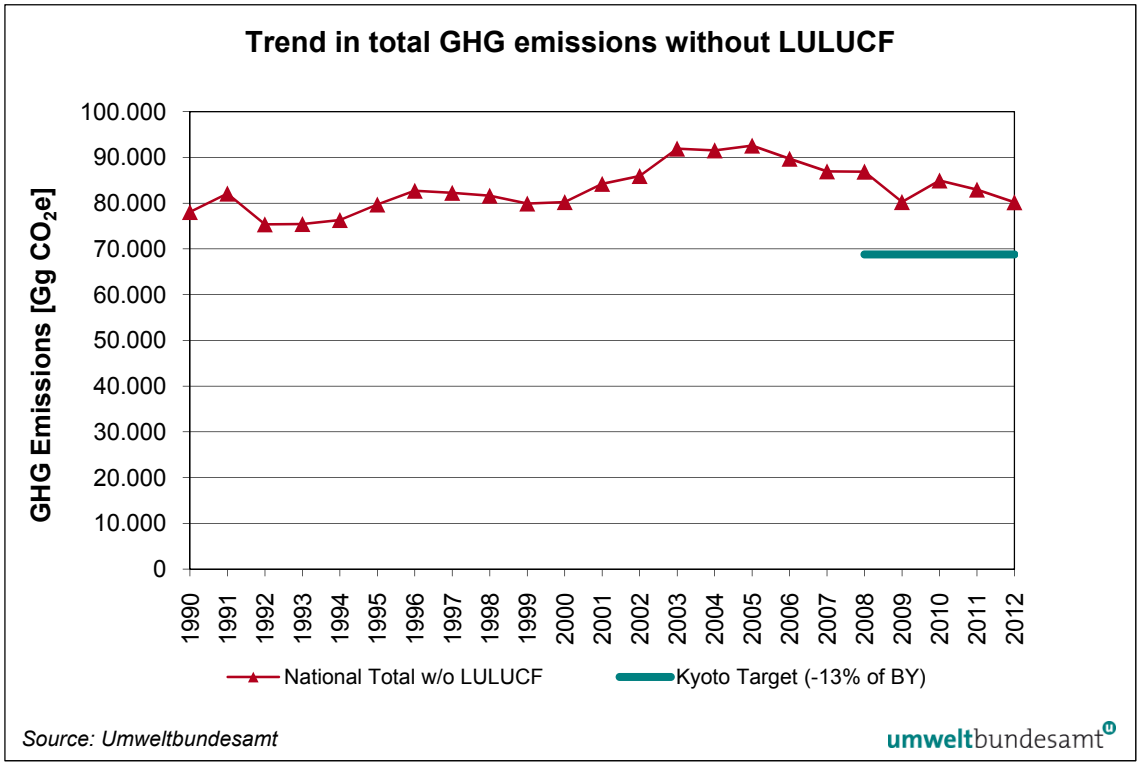

Figure 1: Trend in total GHG emissions 1990–2012 without LULUCF.

Changes in emissions from 2011 to 2012

The **key driver** for the emissions decline between 2011 and 2012 was the decreasing consumption of fossil fuels and the increased use of hydro power for electrical power generation.

[17] http://ec.europa.eu/clima/policies/g-gas/docs/table_emm_limitation_en.pdf

GHG emissions from the sector **energy industries** (1.A.1) declined by 10.1% from 2011 to 2012 as a result of the decreased use of oil and gas and increased use of renewable sources, especially hydro power (+28%). The decreasing emissions in the subsector 1.A.4 **other sectors** (-6.6% from 2011 to 2012) are also attributable to the decreased consumption of heating oil and gas and the increased use of biomass.

In 2012 GHG emissions from **road transport** decreased by 0.5% compared to 2011, mainly due to a slight decrease in fossil fuel consumption.

GHG emissions from **industrial processes** declined by 2.2% from 2011 to 2012, mainly due to decreased production volumes in major industries such as iron and steel.

GHG emissions from **solvents** increased by 4.6% from 2011 to 2012 whereas in the same period GHG emissions from **agriculture** showed a decrease by 1.0% and from sector **waste** by 4.6%.

Table 3: 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	55.400	10.005	512	8.557	- 9.877	3.587	NA
1995	57.673	9.801	422	8.720	- 11.484	3.096	NA
2000	59.294	10.038	425	7.912	- 15.235	2.558	NA
2001	63.419	10.007	425	7.865	- 17.165	2.504	NA
2002	64.540	10.669	427	7.763	- 11.097	2.522	NA
2003	70.666	10.718	418	7.557	- 1.084	2.566	NA
2004	71.113	10.151	374	7.454	- 6.144	2.447	NA
2005	71.809	10.613	387	7.416	- 7.627	2.345	NA
2006	68.576	10.986	415	7.452	- 1.809	2.269	NA
2007	65.466	11.425	388	7.517	- 752	2.159	NA
2008	64.895	11.911	367	7.653	138	2.063	NA
2009	60.650	9.739	299	7.634	- 3.906	1.928	NA
2010	64.551	10.781	327	7.468	- 3.894	1.826	NA
2011	62.193	11.125	320	7.578	- 3.873	1.737	NA
2012	59.843	10.877	335	7.499	- 3.840	1.657	NA

** Net emissions*

The most important GHG in Austria is carbon dioxide (CO_2) with a share of 84.6% in 2012. The CO_2 emissions primarily result from combustion activities. Methane (CH_4), which mainly arises from stock farming and waste disposal, contributed 6.6% to national total GHG emissions, and nitrous oxide with agricultural soils as the main source added another 6.5% in 2012. The remaining 2.2% 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 4: Austria's anthropogenic greenhouse gas emissions by gas 1990–2012 without LULUCF.

Greenhouse gas emissions	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Total (without LULUCF)
	CO_2 equivalents (Gg)						
1990	62.018	8.307	6.198	23	1.023	493	**78.061**
1995	63.924	7.621	6.606	340	68	1.153	**79.712**
2000	65.993	6.627	6.291	647	67	602	**80.227**
2001	70.029	6.491	6.177	774	90	660	**84.220**
2002	71.748	6.393	6.179	875	83	643	**85.921**
2003	77.801	6.388	6.106	953	102	576	**91.925**
2004	78.229	6.247	5.410	1.020	125	507	**91.539**
2005	79.393	6.087	5.449	997	125	517	**92.569**
2006	76.633	5.966	5.483	1.004	137	475	**89.697**
2007	73.980	5.854	5.510	1.043	184	384	**86.955**
2008	73.812	5.742	5.694	1.082	167	391	**86.888**
2009	67.665	5.646	5.418	1.134	29	358	**80.249**
2010	72.506	5.566	5.179	1.286	64	352	**84.953**
2011	70.541	5.398	5.284	1.349	60	322	**82.954**
2012	67.890	5.300	5.222	1.431	40	326	**80.211**

The dominant sector regarding GHG emissions in Austria is *Energy*, which caused 74.6% of total greenhouse gas emissions in Austria in 2012 (71.0% in 1990), followed by the sectors *Industrial Processes* (13.6% in 2012) and *Agriculture* (9.3% in 2012).

Table 5: Austria's greenhouse gas emissions by sector in the base year (1990) and in 2012 as well as their share and trend.

GHG	1990	2012	Trend 1990–2012	1990	2012
	Emissions [Gg CO_2e]			Share [%]	
Total	**78.061**	**80.211**	**+2.8%**	**100.0%**	**100.0%**
1 Energy	55.400	59.843	+8.0%	71.0%	74.6%
2 Industry	10.005	10.877	+8.7%	12.8%	13.6%
3 Solvent	512	335	-34.6%	0.7%	0.4%
4 Agriculture	8.557	7.499	-12.4%	11.0%	9.3%
5 LULUCF	-9.877	-3.840	-61.1%	–	–
6 Waste	3.587	1.657	-53.8%	4.6%	2.1%

Total emissions without emissions from LULUCF

In 2012 emissions from *Industrial Processes* were 8.7% higher than in 1990. Emissions from sector *Energy* increased by 8.0% over this period. The other sectors show decreasing GHG emissions. The most significant decreases in absolute terms occurred in the sectors *Waste* and *Agriculture*.

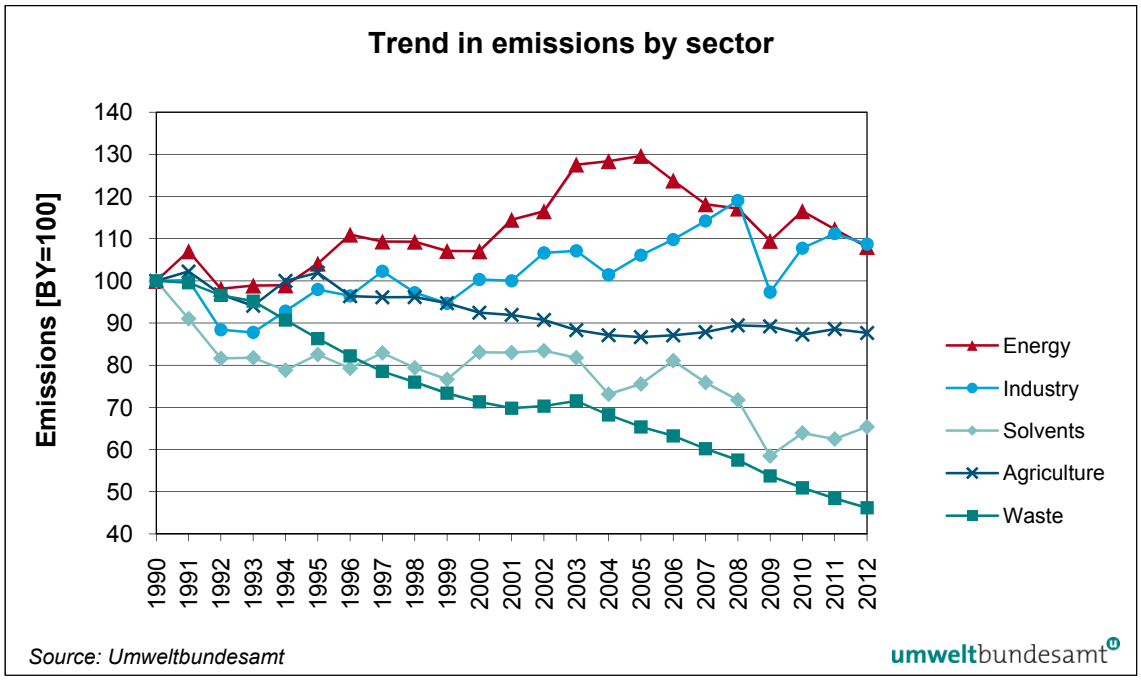

Figure 2: Trend in emissions 1990–2012 by sector in index form (1990 = 100).

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

2.1 Energy

In 2012, greenhouse gas emissions from sector *Energy* sector amounted to 59 843 Gg CO_2 equivalents which correspond to 74.6% of the total national emissions. 99.2% of the emissions from this sector originate from fossil fuel combustion; fugitive emissions from fuels are of minor importance.

The **most important sub-sector** is *transport* with a share of 36.2% in 2012, followed by *manufacturing industries and construction* (26.3%), *energy industries* (20.8%), and the subsector *other sectors* (15.9%).

The **overall trend** in greenhouse gas emissions from the sector *Energy* shows increasing emissions with a plus of 8.0% from 1990 to 2012. The **main driver** for this trend is road transport with a strong increase of emissions (+54.2%) from 1990 to 2012. 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 as reflected in the gross domestic product (GDP)

In 2012 CO_2 contributed 98.1% to the total **greenhouse gas** emissions from the energy sector, N_2O 1.1% and CH_4 0.8%.

From 2011 to 2012, emissions from the energy sector decreased by 3.8%. Main drivers for the emission reduction are lower heating oil sales and a reduction of natural gas use for space heating and an increase of electricity production by hydro plants, which goes along with lower electricity production by thermal power plants.

Trend 1990–2012 – by subsector

Transport showed a strong increase in emissions since 1990 (+54.2%) mainly due to an increase of road performance (kilometres driven) in passenger and freight transport. In addition to the increase of road performance within Austria, the amount of fuel sold in Austria but driven elsewhere – an effect mainly caused by higher 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 2011 to 2012 fuel consumption (gasoline, diesel and alternative fuels) by road transport and mobile off-road vehicles declined by 0.5%, a slight decrease which was mainly due to continued increasing fuel prices in 2012. Specific consumption per vehicle kilometer also declined between 2011 and 2012, by 2% for passenger cars and by 0.2% for heavy duty vehicles.

Energy related GHG emissions from **manufacturing industries and construction** increased by 23.2% from 1990 to 2012. Fuel consumption increased by 49.7% 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 2012 emissions from the sub-sector **energy industries** were 10.1% below the level in 1990. Emissions from power plants were continuously decreasing since 2005, mainly because of the growing contribution 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 24.5% (2012), the contribution of hydro and wind power plants to total public electricity production increased from 69% to 76% (2012).

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 2012 were 34.1% lower than in 1990. 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 decreased by -10.4% since 1990.

Fugitive emissions increased by 52.8% since the year 1990. This increase is mainly due to emissions from oil production and natural gas distribution and transmission.

2.2 Industrial Processes

In 2012, greenhouse gas emissions from industrial processes amounted to 10 877 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 8.7% from 1990 to 2012. 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 primary aluminium production in 1993, (ii) the introduction of N_2O abatement technologies in the chemical industry in 2004 and in 2009 (which became fully operational in 2010), (iii) increasing metal production resulting in 47% higher GHG emissions in 2012 compared to 1990 and (iv) a strong increase of HFC emissions in the period 1992 to 2012 from 27 to 1 431 Gg CO_2 equivalents.

From 2011 to 2012, overall emissions from this sector decreased by 2.2%, mainly due to decreased production volumes and emissions in major industries such as iron and steel. The largest decrease in emissions was observed in metal production (-3.8%) and in the subcategory mineral products (-2.8%).

The most important **greenhouse gas** of this sector was carbon dioxide with contribution of 82.8% of emissions, followed by HFCs with 13.2%, SF_6 with 3.0%, N_2O with 0.5%, PFCs 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 generated 50.4% and 27.1%, respectively, of the overall emissions from this sector in 2012.

2.3 Solvent and Other Product Use

In 2012, greenhouse gas emissions from solvent and other product use amounted to 335 Gg CO_2 equivalents, which correspond 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 35% from 1990 to 2012. 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 2011 to 2012 emissions increased by 4.6% due to an increased use of solvents.

56.5% of these **greenhouse gas** emissions were indirect CO_2 emissions (resulting from NMVOC oxidations), 43.5% were contributed by N_2O emissions.

2.4 Agriculture

In 2012, emissions from agriculture amounted to 7 499 Gg CO_2 equivalent, which corresponds to 9.3% of the total national emissions.

The **overall trend** in greenhouse gas emissions from agriculture shows decreasing emissions, with a decrease of 12.4% from 1990 to 2012. 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 variation of the sales of mineral fertilizer due to volatility in prices.

From 2011 to 2012 emissions decreased by 1.0% due to decreased livestock numbers of cattle and swine.

In the Austrian **greenhouse gas** inventory the sector agriculture is the largest source for both N_2O and CH_4 emissions: In 2012 76% (13 Gg) of total N_2O emissions and 67% (168 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 CH_4 to 47%.

The two **most important sub-sectors** of agriculture are enteric fermentation, which contributed 43% of total greenhouse gas emissions from the agricultural sector, followed by agricultural soils with a contribution of 41%.

2.5 LULUCF

As announced in NIR 2013, the submission 2014 contains for the first time the estimates of the detailed assessments of the ARD activities under Article 3.3 of the Kyoto Protocol including corresponding carbon stock changes in biomass and dead wood. This ARD assessment was carried out in the years 2011 to 2013. On the basis of these assessments, the areas of land-use-changes to and from forests, the emission factors at these lands and the estimates of emissions/removals at these lands were revised also. For area consistency reasons this also led to slightly updated areas in some other LUC subcategories.

In response to review findings the estimates of the emissions/removals in mineral soils of LUC categories with wetlands were also revised.

These changes triggered a revision of the whole time series and to slightly different total removals/emissions of the whole LULUCF sector compared to previous submissions. Although the emissions/removals of single subcategories changed significantly due to these improvements, the total net removals for the LULUCF category increased only a few per cent compared to previous submissions.

In 2012, net removals from the category LULUCF amounted to 3 840 Gg CO_2 equivalents, which corresponds to 4.8% of the national total GHG emissions (without LULUCF) in 2012 compared to 13% in the base year.[18]

The **overall trend** in net removals from LULUCF is minus 61% over the observed period. The **main driver** for this trend is the increase 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 4 487 Gg CO_2 in 2012. CO_2, CH_4 and N_2O emissions arise from the other sub-sectors, with total net emissions amounting to 647 Gg CO_2 equivalents in 2012. The last available NFI for the estimates in the sector 5.A.1 (forest land remaining forest land) is the NFI 2007/09. For the years after 2008 the mean results for the NFI period 2007/09 are reported as proxy data for this sector.

The emission estimates for the ARD lands were also changed for the first Commitment Period of the Kyoto Protocol on basis of these new activity data and emission factors due to the finalised ARD assessment. Due to these changed input data the annual net removals of ARD activities are on average about 10% higher than in previous submissions.

[18] 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 did not elect any of the activities under Article 3.4 of the KP).

2.6 Waste

The **overall trend** in greenhouse gas emissions from waste shows decreasing emissions, with a decrease of 53.8% from 1990 to 2012. 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 disposed 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 disposal of waste as well as the landfill gas recovery is the Landfill Ordinance. Since 2009 all waste with high organic content has to be pre-treated before deposition (without exceptions).

From 2011 to 2012 GHG emissions decreased by 4.6% as a result of the declining emissions from waste being deposited in the past.

In 2012, greenhouse gas emissions from the waste sector amounted to 1 657 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% of the total GHG emissions from this sector in 2012, followed by N_2O with 23%, and CO_2 with 0.1%.

The **most important sub-sector** of the waste sector is solid waste disposal on land, which caused 72% of the emissions from this sector in 2012; the second largest source is waste water handling with a contribution of 17%.

3 METHOD OF REPORTING AND DATA BASIS

The Austrian greenhouse gas inventory for the period 1990 to 2012 was compiled according to the recommendations for inventories as set out in the updated UNFCCC reporting guidelines on annual inventories following incorporation of the provisions of decision 14/CP.11., the Common Reporting Format (CRF), Decision 13/CP.9[19], the new CRF for the Land Use, Land Use Change and Forestry Sector[20], the revised 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 (TACCC) of inventories. Above this, each Party shall have in place a national system[21] 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 (QA/QC) 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 0 and 3.5. Issues identified in the review of GHG inventories by the EC and UNFCCC are considered in the inventory improvement programme. The last in-depth review took place from 30th of September to 05th of October 2013, which is announced on the website of the UNFCCC[22]. The results are expected to be published in spring 2014.

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).

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[19] Good practice guidance for land use, land-use change and forestry in the preparation of national greenhouse gas inventories under the Convention; FCCC/CP/2003/6/Add.1

http://unfccc.int/resource/docs/cop9/06a01.pdf#page=31

[20] 14/CP.11; FCCC/CP/2005/5/Add.2

http://unfccc.int/resource/docs/2005/cop11/eng/05a02.pdf#page=2

[21] 19/CMP.1 Guidelines for national systems under Article 5, paragraph 1, of the Kyoto Protocol; FCCC/KP/CMP/2005/8/Add.3

http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf

[22] Review of the annual submission of Austria submitted in 2013

http://unfccc.int/national_reports/annex_i_ghg_inventories/inventory_review_reports/items/6947.php

The complete tables of the Common Reporting Format (CRF), including in particular Sectoral Reports, Sectoral Background Tables and the Reference Approach for CO_2 are submitted separately in digital form only[23].

Table 6: Status of the present report.

Reporting Obligation	Format	Inventory	Version
Mechanism for monitoring Community greenhouse gas emissions	Common Reporting Format (CRF)	OLI 2013	January 15th 2014

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 2011 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 7: Recalculation difference of Austria's greenhouse gas emissions compared to the previous submission.

	1990 (Base year)	2011
	Recalculation Difference [%]	
Total	**-0.12%**	**+0.14%**
CO_2	-0.07%	+0.12%
CH_4	+0.03%	+0.68%
N_2O	+0.00%	-0.19%
HFC, PFC, SF_6	-3.55%	-0.00%

Emissions without LULUCF

National total emissions (excluding LULUCF) for the **base year** have been slightly revised downwards since last years' submission (-95.7 Gg CO_2e), mainly due to the elimination of a double counting in 2.B.1 Ammonia Production (in response to a finding of the In-Country Review 2013) as well as the correction of a transcription error in the calculation of PFC emissions (C_2F_6) in 2.B.1 Aluminium Production.

Revised total emissions for **2011** are 112 Gg CO_2 equivalents higher than the value submitted last year. These recalculations resulted in a slightly revised trend 1990–2011 from +6.0% to +6.3%. The higher GHG emissions 2011 are mainly attributable to revisions of the energy balance. Furthermore updated data on landfill gas recovery became available, affecting the CH_4 emissions from solid waste disposal sites (6.A) leading to higher emissions for 2008–2011.

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.

[23] http://cdr.eionet.europa.eu/at/eu/AT%20GHG/coluq7lfw/envuq7obg

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.

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[24], in Austria's NIR 2011[25] and in the NISA Implementation Report[26].

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[27]), 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.

[24] 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.

[25] UMWELTBUNDESAMT (2013): Austria's National Inventory Report 2013, Submission under the United Nations Framework Convention on Climate Change and under the Kyoto Protocol, REP-0416, Umweltbundesamt, Vienna.

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

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

Sector Experts

Within the inventory system specific responsibilities for the different emission source/sink categories ('Sector Experts') are defined. There are 8 sectors defined (Energy, Transport, Fugitive Emissions, IP, Solvents, Agriculture, LULUCF and Waste). Two experts form a sector team, whereas one team member is nominated as team leader ('Sector Lead'). 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.

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 8: 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)
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 (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[28]
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	Federal Waste Management Plan (Data sources: 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[29]
  - 2000 IPCC Good Practice Guidance (GPG) and Uncertainty Management in National Greenhouse Gas Inventories[30]

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

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

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

  - 2003 Good Practice Guidance for Land Use, Land-Use Change and Forestry[31]
  - 2006 IPCC Guidelines for National Greenhouse Gas Inventories[32]
- EMEP/CORINAIR Emission Inventory Guidebook
  - 2nd edition – 1999. EEA Technical Report No. 30
  - 3rd edition October 2002 UPDATE. EEA Technical report No 30[33]
  - 2006, EEA Technical report No 11/2006[34]
  - 2007, EEA Technical report No 16/2007[35]
- EMEP/EEA air pollutant emission inventory guidebook – 2009. Technical report No. 6/2009.[36] (previously known as EMEP/CORINAIR Emission Inventory Guidebook)
- EMEP/EEA air pollutant emission inventory guidebook – 2013. Technical report No. 12/2013.[37]
- Handbook emission factors for road transport (HBEFA), Version 3.2 (planned to be published by INFRAS, Bern/Switzerland, by beginning of 2014)

A complete list of data sources for activity and emission data or emission factors used by sector for the submission 2014 can be found in the National Inventory Report 2014 to be published in spring 2014.

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 1990–2011 will be given in Austria's National Inventory Report 2014, which will be published in spring 2014.

3.5.1 Energy

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

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

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

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

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

[35] 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

[36] 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

[37] http://www.eea.europa.eu/publications/emep-eea-guidebook-2013

Energy balance update and corrections

For natural gas the net calorific value calculation method has been revised from the year 2005 onwards. The previous method was: Net calorific value = gross calorific value /1.1. The new method is: Net calorific value = gross calorific value * 0.9. This new calculation method resulted in a lower inland consumption of about -1%.

Other revisions conducted for natural gas affect the years 2009 to 2011 only. About 2.1 to 4.0 Petajoules (PJ) have been shifted from public power and district heating plants to final energy consumption. Within final energy consumption between 4.9 and 7.3 PJ has been shifted from 'other sectors' to 'manufacturing industries'. After consideration of all revisions (final energy consumption and transformation input) the overall change according to the OLI methodology results in a significant higher natural gas consumption of 'manufacturing industries' (+10.8 PJ) and a significant lower consumption in 'other sectors' in the year 2011 (-7.3 PJ).

For residual fuel oil the whole time series has been revised. A big share of 'other liquid fuels', which are used in the refinery, have been reallocated as 'residual fuel oil'. While this revision does not imply a change of total gross inland consumption until 2008, the final energy consumption is affected by this revision from the year 2009 on. This causes a lower final energy consumption of -2.2 PJ in 2011 and mainly affects 'other sectors'.

Other main revisions from 2009 onwards arise from the reallocation of log wood to 'other solid biomass' (mainly wood waste of wood processing and pulp and paper industries) as well as the separate reporting of the biomass-share of industrial waste in the manufacturing industries. Thus, the industrial waste now considers consequently the pure fossil content (carbon) only.

Revision of GHG emissions

A double counting of non-energy use of natural gas in 1.A.1.b petroleum refining has been eliminated. The CO_2 emissions from of natural gas used for hydrogen production are already considered in the ETS. In the previous inventory this consumption was considered under category 1.A.2.f gaseous fuels.

Other revisions of emission estimates followed the revisions of the energy balance. Neither emission factors nor calculation methodologies have been changed since the 2013 submission.

The implied emission factors of 1.A.2 – other fuels (industrial waste) have been revised upwards from 2008 on because the share of biomass in industrial waste has been moved to biomass fuels.

Revision according to review recommendations

According to the In Country Review 2013 the following additional sources have been estimated:

- 1.A.1.b Petroleum refining – CH_4 emissions have been estimated which has been reported as 'IE' in the previous inventory(+1 Gg CO_2 equivalent in 2011).
- 1.A.4 Other sectors – CH_4 and N_2O emissions from char coal use have been estimated (+1.8 Gg CO_2 equivalent in 2011).

Mobile sources

Update/Improvement of activity data

In 2013, 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

In the national energy balance the levels for liquid gas (LPG) and natural gas (CNG) were changed retrospectively for the years 2009, 2010 and 2011. LPG activity data was revised downwards, CNG activity data slightly upwards. Necessary adjustments in the inventory transport model[38] caused slightly revised GHG emission data for individual years. In total, activity data for LPG and CNG shows a reduced fuel use. This, however, has no significant effect on overall emissions due to the small absolute quantities of LPG and CNG used in sector transport.

1.A.2.f, 1.A.4.a,b,c Mobile Sources (Off-Road)

By updates due to changes in the time series of the national energy balance, diesel consumption of railways was retrospectively changed. This activity data has been adjusted for 2009, 2010 and 2011 and resulted in reduced GHG emissions from railways (-18.9% in 2011).

Emissions from the off-road construction industry were recalculated due to a posteriori statistical change in the construction production index for the year 2011 resulting in slightly increased GHG emissions (+0.4% in 2011).

Revisions of the national energy balance resulted in minor adjustments of the sectorial diesel consumption data applied in the national off-road model[39].

Update of methodology and emission factors

1.A.3.b Road Transport

Road transport emission factors applied in the previous submission were based on the preliminary HBEFA V3.1 update (Handbook Emission Factors for Road Transport), whereas in this submission EFs were obtained from the final version V3.2 of the HBEFA. The official release of HBEFA V3.2 is expected by the beginning of 2014.

The use of updated EFs for Euro 5 and Euro 6 vehicles resulted in significantly lower emissions from light duty vehicles due to reduced fuel consumption data for EURO 5 (EURO 6 shows a smaller reduction) whereas emissions from heavy duty vehicles increased due to increased fuel consumption data for EURO 5 (EURO 6 had to be raised by a higher extent).

Overall revisions of the sector road transport show a slight increase of GHG emissions (+0.06% for 2011).

3.5.2 Fugitive Emissions

1.B.1.b Solid Fuel Transformation

In response to the Saturday Paper from the ERT (In-Country Review 2013) CH_4 emissions from charcoal production were estimated and reported for the first time[40], leading to slightly higher fugitive emissions over the whole time series (e.g. 2011: + 0.74 Gg CO_2e).

[38] HAUSBERGER, S. & SCHWINGSHACKL, M. (2013): Straßenverkehrsemissionen und Emissionen sonstiger mobiler Quellen Österreichs für die Jahre 1990 bis 2012 (OLI2013); erstellt im Auftrag der Umweltbundesamt GmbH, Graz, 2013.

[39] HAUSBERGER, S. & SCHWINGSHACKL, M. (2013): Straßenverkehrsemissionen und Emissionen sonstiger mobiler Quellen Österreichs für die Jahre 1990 bis 2012 (OLI2013); erstellt im Auftrag der Umweltbundesamt GmbH, Graz, 2013.

[40] as a resubmission of the times series 1990-2011 in November 2013 (AT_Submission_2013_v1.3_CRF)

3.5.3 Industrial Processes

Update of activity data

2.A.2 Lime Production

Activity and emission data were updated based on information available from the Association of the Stone & Ceramic Industry, resulting in slightly lower emissions in the years 2002, 2003 and 2004.

2.*C.1 Pig Iron*

Revised coke input data became available in the energy balance for the year 2011, leading to lower CO_2 emissions (-95 Gg) in that year.

2.F.1 Refrigeration and air conditioning equipment

Based on a new study, the number of heat pumps installed in 2011 was adjusted, resulting in slightly lower HFC emissions in that year.

Improvements of methodologies and emission factors

2.A.2 Lime Production

For the year 2006, a transcription error in the emission estimate was corrected, resulting in lower emissions in that year.

2.B.1 Ammonia Production

In response to a finding of the 2013 in-country review, the carbon inputs and outputs of Austria's integrated ammonia plant were reviewed. As CO_2 emissions from fertilizer production and nitric acid production are reported under the respective subcategories, they were subtracted from CO_2 emissions reported under ammonia production. This subtraction resulted in lower CO_2 emissions in the order of 20 to 40 Gg per year for the whole time series.

2.C.3 Aluminium Production

A transcription error in the calculation of C_2F_6 emissions was corrected, leading to lower emissions in the order of 2 to 6 tonnes of C_2F_6 in the years 1990–1992.

2.F.1 Refrigeration and air conditioning equipment

In the sub-category "mobile air condition", a transcription error in the emission calculation for the year 2011 was corrected, resulting in slightly lower HFC emissions in that year.

3.5.4 Solvent and other Product Use

Update of activity data

3.A Paint application, 3.B Degreasing and dry cleaning, 3.C Chemical products, 3.D OTHER including containing HMs and POPs – CO_2 emissions

The usage of the latest production statistics data (special reporting of solvent containing substances and products) slightly changed the CO_2 emissions 2011 (+0.03 Gg).

3.D.1 Use of N_2O for anesthesia – N_2O emissions

Updated information for the usage of N_2O for medical purpose leads to a reduction of N_2O emissions (-4.5 Gg CO_2eq in 2011).

3.5.5 Agriculture

Improvements of methodologies and emission factors

4.B Manure Management

The share of anaerobic digestion has been revised on the basis of new input data provided by the Austrian Energy Regulator E-Control. The revision caused slightly higher methane emissions in previous years and minor changes in N_2O emissions.

3.5.6 LULUCF

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

5.A Forest land

The areas of the LUC subcategories to forests were changed on basis of the ARD assessment that was finalised in 2013. Also the biomass stock changes and dead wood stock changes at these LUC lands were measured accurately during this assessment. So, the emission estimates for the 5.A.2 lands and for the whole time series were changed on basis of these new activity data and emission factors. These changes have also an impact on the results of 5.A.1 which are based on the results of the NFIs for all Austria minus those biomass and dead wood stock changes due to LUCs involving forests (in order to avoid double accounting). A change in 5.A.2 or in LUC categories from forest to other land uses represents also a change in subtrahends for the derivation of the results for the subcategory 5.A.1 on basis of the NFI results for all Austria.

These changes in the activity data of the 5.A.2 sub-categories led also to different mean soil C stocks to be used for the estimates of the soil C stock changes of the 5.A.2 subcategories and consequently to a change in the emission/removal figures.

Furthermore, in response to a review finding the estimates of the soil C stock changes in the LUC category WL to FL were assumed to be 0.

5.B Cropland

The areas of the LUC subcategory FL to CL were changed on basis of the ARD assessment that was finalised in 2013. Also the biomass stock changes and dead wood stock changes at these LUC lands were measured accurately during this assessment. So, the emission estimates for this subcategory and for the whole time series changed on basis of these new activity data and emission factors.

The LUCs between perennial and annual CL and the LUCs between CL and GL of the most recent years were updated on basis of an assessment of the most recent statistics. In addition, an identified error in the extrapolation factor from the assessed subsample to all Austria in previous submissions was corrected.

5.C Grassland

The areas of the LUC subcategory FL to GL were changed on basis of the ARD assessment that was finalised in 2013. Also the biomass stock changes and dead wood stock changes at these LUC lands were measured accurately during this assessment. So, the emission estimates for this subcategory and for the whole time series changed on basis of these new activity data and emission factors.

The LUCs between CL and GL of the most recent years were updated on basis of an assessment of the most recent statistics. In addition, an identified error in the extrapolation factor from the assessed subsample to all Austria in previous submission was corrected. .

5.D Wetlands

The areas of the LUC subcategory FL to WL were changed on basis of the ARD assessment that was finalised in 2013. Also the biomass stock changes and dead wood stock changes at these LUC lands were measured accurately during this assessment. So, the emission estimates for this subcategory and for the whole time series changed on basis of these new activity data and emission factors. Furthermore, in response to a review finding the soil C stock changes in the LUC-categories to WL were assumed to be 0.

An update of these LUC areas led also to different LUC lands GL to WL due to area consistency reasons. As a consequence, the related emissions/removals of this LUC category had to be revised.

5.E Settlements

The areas of the LUC subcategory FL to SL were changed on basis of the ARD assessment that was finalised in 2013. Also the biomass stock changes and dead wood stock changes at these LUC lands were measured accurately during this assessment. So, the emission estimates for this subcategory and for the whole time series changed on basis of these new activity data and emission factors.

An update of these LUC areas led also to different LUC lands CL to SL and GL to SL due to area consistency reasons. As a consequence, the related emissions/removals of these LUC subcategories had to be revised.

5.F Other lands

The areas of the LUC subcategory FL to OL were changed on basis of the ARD assessment that was finalised in 2013. Also the biomass stock changes and dead wood stock changes at these LUC lands were measured accurately during this assessment. So, the emission estimates for this subcategory and for the whole time series changed on basis of these new activity data and emission factors.

An update of these LUC areas led also to different LUC lands GL to OL due to area consistency reasons in the GL category. As a consequence, the related emissions/removals of this LUC subcategories had to be revised.

LULUCF KP estimates

The areas of the ARD activities were changed on basis of the ARD assessment that was finalised in 2013. Due to this assessment the areas of both, AR and D, are smaller than in previous submissions. The biomass stock gains and losses at the ARD lands and dead wood stock changes at the ARD lands in the Kyoto-Period were for the first time measured accurately during this assessment.

These changes in the ARD activity data led also to different mean soil C stocks to be used for the estimates of the soil C stock changes at the ARD lands. Furthermore, in response to a review finding the soil C stock changes in the AR- and D-categories with WL were assumed to be 0. AR lands from WL are more than D lands to WL, so this approach is conservative because it underestimates the net removals of both subcategories in the mineral soil pool.

In addition, in response to a review finding the emissions due to liming at D lands to CL and GL were estimated for the first time.

So, the emission estimates for the ARD lands and for the whole Kyoto-Protocol-period were changed on basis of these new activity data and emission factors. While the emissions and removals in the single activities of AR and D changed significantly, the net result of ARD represents 10% higher average annual net removals compared to previous submissions.

3.5.7 Waste

Update of activity data

6.A Managed Waste Disposal on Land

New data on the landfill gas recovery became available, leading to revised CH_4 emissions for 2008–2011. Based on a new study on landfill gas practice in Austria, less CH_4 is recovered and consequently more CH_4 emitted (recalculation 2011: +33 Gg CO_2e).

6.B Wastewater Handling

Statistics on the Austrian population have been revised downwards, leading to slightly revised emission data for 2007–2011 (recalculation 2011: -1.1 Gg CO_2e).

6.D Other waste

GHG emissions have been recalculated (-3.6 Gg CO_2e) for the following reasons:

- updated activity data (2010, 2011) of waste amounts treated in mechanical-biological treatment plants (revision downwards)
- updated activity data (2011) on biologically treated waste
- revised population numbers

3.5.8 Improvements made in response to the UNFCCC Review

Improvements made for the submission 2014 in response to the issues raised in the UNFCCC review process are summarized in Table 9, as far as methodological issues are concerned and 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 2014.

Table 9: Improvements made in response to the UNFCCC review process.

Finding	Reference	Improvement made
Energy		
The ERT noted that Austria does not report emissions associated with charcoal use, although this is reported in official statistics (FAOSTAT, IEA Joint Questionnaire), and considers this as a case of underestimation (potential problem)	ICR 2013 / Saturday Paper	Charcoal consumption is now considered in the inventory emissions from this source are reported.
Fugitive Emissions		
The ERT noted that CH_4 fugitive emissions from charcoal production are not reported although official data are available (FAOSTAT), and considers this as a case of underestimation (potential problem)	ICR 2013 / Saturday Paper	Charcoal production and respective emissions are now considered in the inventory.
Industrial Processes		
Ammonia, fertilizers and other chemicals are produced in a single integrated plant in Austria. The ERT pointed out that CO_2 emissions from fertilizer production are reported both under “fertilizer production” and “ammonia production”, thus constituting a double-counting issue.	ICR 2013	All carbon inputs and outputs of the integrated plant were reviewed. As CO_2 emissions from fertilizer production and nitric acid production are reported under the respective subcategories, they were subtracted from the CO_2 emissions under ammonia production.
Solvents and Other Product Use		
No revisions in response to the UNFCCC Review since previous submission		
Agriculture		
No revisions in response to the UNFCCC Review since previous submission		
LULUCF		
Recommendation to carry out a more conservative estimate of the emissions/removals in the soils at LUC lands from or to WL (surface waters).	ICR 2013	C stock changes in mineral soils of LUC lands to and from WL were assumed to be 0. LUC lands from WL are more than LUC lands to WL, so this approach is conservative because it underestimates the net removals of both subcategories in the mineral soil pool.
KP LULUCF		
Recommendations to estimate and report emissions/removals of the dead wood stock changes at ARD lands and harvest at AR lands	Last CRRs and ICR 2013	The ARD assessment finalised in 2013 included measurements of the dead wood stock changes, biomass stock changes and biomass harvest at the ARD lands. So, the emissions/removals due to these changes were completely estimated for submission 2014.
Recommendation to estimate and report emissions from liming at D lands to CL and GL	ICR 2013	These emissions were estimated for submission 2014
Biomass emission from settlement conversion AR not reported	ICR 2013	These emissions were estimated for submission 2014

Finding	Reference	Improvement made
Recommendation to carry out a more conservative estimate of the emissions/removals in soils at ARD lands from or to WL (surface waters).	ICR 2013	C stock changes in mineral soils of ARD lands to and from WL were assumed to be 0. AR lands from WL are more than D lands to WL, so this approach is conservative because it underestimates the net removals of both subcategories in the mineral soil pool.
Waste		
The ERT recommends the Party to provide a description on its plan to recalculate recovered landfill gas in the NIR.	ICR 2013	Results of a study on landfill gas recovery became available and are now considered in the waste model.

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 accuracy as well as 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 (AkkG)[41] by decree of the Minister of Economics and Labour[42].

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 2014.

[41] *„Akkreditierungsgesetz”*; Federal Law Gazette No. 28/2012

[42] No. BMWA-92.715/0036-I/12/2005, issued on 19 January 2006, valid from 23 December 2005

Changes to the QMS since the last submission

In 2013, the organisation of the IBE personnel has been improved by replacing the originally designated 'sector deputy' by a "second, technically equally competent" sector expert, more actively being involved in the inventory preparation. Now two sector experts (SE) per sector form a sector team, whereas one team member is nominated as the team leader ('sector lead' SL). Moreover, a new function within the IBE called 'cross-sectoral inventory support' has been established. By these measures the robustness of the system could be further strengthened.

In May 2013 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. Some improvement measures, mainly small changes in the Quality Manual in adaption to the 2012 revised Accreditation Law, had to be implemented. Moreover a risk analysis was carried out by an external institution to identify and assess potential IT risks, finally confirming the robustness of the system.

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[43] 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[44].

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 2013 using the method developed in WINIWARTER (2008)[45] based on the Tier 2 approach (Monte-Carlo Analysis).

[43] 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.

[44] 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.

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

Table 10: Key results of the Austrian GHG inventory uncertainty analysis 2013.

Random uncertainty		excl. LULUCF							incl. LULUCF
		CO_2	CH_4	N_2O	PFC	HFC	SF_6	Total GHG	Total GHG
1990	Mean value [Tg]	62.06	8.31	6.20	1.08	0.02	0.49	**78.17**	**68.21**
	Standard deviation	0.37	0.62	2.69	0.26	0.01	0.04	**2.80**	**9.62**
	2s	**1.2%**	**15.0%**	**86.8%**	**48.9%**	**49.2%**	**16.0%**	**7.2%**	**28.2%**
2011	Mean value [Tg]	70.45	5.36	5.29	0.06	1.35	0.32	**82.84**	**79.33**
	Standard deviation	0.58	0.40	2.44	0.00	0.36	0.08	**2.56**	**8.75**
	2s	**1.6%**	**14.7%**	**92.1%**	**11.2%**	**54.0%**	**48.8%**	**6.2%**	**22.1%**

**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.

Table 11: 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	28 037	17 039	12 146	**57 222**	28 113	13 924	11 301	732	**54 070**
1991	30 439	17 780	12 841	**61 061**	30 589	14 518	11 940	805	**57 852**
1992	29 535	13 887	12 610	**56 031**	29 322	10 666	12 000	956	**52 945**
1993	30 620	12 530	13 298	**56 448**	30 731	9 495	12 453	675	**53 354**
1994	29 954	12 754	13 679	**56 387**	30 100	9 379	13 111	820	**53 410**
1995	30 471	14 448	14 935	**59 853**	30 309	10 741	14 339	839	**56 228**
1996	32 896	14 484	15 897	**63 277**	32 921	10 760	15 287	1 073	**60 041**
1997	32 374	15 283	15 321	**62 978**	32 123	11 319	14 720	1 017	**59 179**
1998	34 581	13 550	15 729	**63 860**	34 247	8 905	15 144	818	**59 114**
1999	32 585	13 366	16 004	**61 955**	32 399	9 239	15 412	825	**57 875**
2000	31 865	14 922	15 273	**62 060**	31 880	10 486	14 686	816	**57 868**
2001	34 213	15 400	16 186	**65 799**	34 130	11 249	15 632	936	**61 947**
2002	34 772	15 749	16 160	**66 681**	35 220	11 173	15 582	1 129	**63 105**
2003	37 226	16 702	17 721	**71 650**	38 052	12 663	17 092	1 338	**69 145**
2004	37 691	16 474	18 042	**72 207**	38 417	12 319	17 405	1 475	**69 615**
2005	38 013	16 657	18 925	**73 595**	38 743	11 889	18 274	1 374	**70 279**
2006	36 885	16 756	17 769	**71 410**	36 907	11 679	16 998	1 486	**67 070**
2007	35 551	15 922	16 757	**68 230**	35 602	10 808	16 141	1 430	**63 981**

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]**
2008	34 713	14 747	17 708	**67 168**	34 573	10 187	17 053	1 644	**63 457**
2009	32 211	11 065	17 328	**60 604**	32 932	7 677	16 777	1 822	**59 207**
2010	33 558	13 406	19 053	**66 017**	33 623	9 161	18 411	1 898	**63 092**
2011	31 453	13 960	18 059	**63 472**	31 639	9 625	17 450	2 090	**60 804**
2012	30 616	12 918	17 198	**60 732**	31 024	8 704	16 510	2 216	**58 454**

Table 12 shows the difference (in percent) between reference and sectoral approach of CO_2 emissions.

Table 12: Difference (in %) of CO_2 emissions by type of fuel.

Year	Liquid	Solid	Gaseous	Total
1990	-0.27%	22.37%	7.48%	5.83%
1991	-0.49%	22.47%	7.55%	5.55%
1992	0.72%	30.19%	5.08%	5.83%
1993	-0.36%	31.97%	6.79%	5.80%
1994	-0.48%	35.98%	4.33%	5.57%
1995	0.53%	34.51%	4.15%	6.45%
1996	-0.08%	34.62%	3.99%	5.39%
1997	0.78%	35.03%	4.08%	6.42%
1998	0.98%	52.16%	3.86%	8.03%
1999	0.57%	44.68%	3.84%	7.05%
2000	-0.05%	42.31%	3.99%	7.24%
2001	0.24%	36.90%	3.54%	6.22%
2002	-1.27%	40.96%	3.71%	5.67%
2003	-2.17%	31.90%	3.68%	3.62%
2004	-1.89%	33.73%	3.66%	3.72%
2005	-1.88%	40.11%	3.56%	4.72%
2006	-0.06%	43.47%	4.54%	6.47%
2007	-0.14%	47.32%	3.82%	6.64%
2008	0.40%	44.77%	3.84%	5.85%
2009	-2.19%	44.14%	3.28%	2.36%
2010	-0.19%	46.33%	3.49%	4.64%
2011	-0.59%	45.03%	3.49%	4.39%
2012	-1.31%	48.42%	4.17%	3.90%

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.

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 -0.8 to +3.0%. 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 sector specific emission factors and NCVs within the sectoral approach and the use of "default fractions of carbon stored" within the reference approach.

Table 13: 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]	Total [Gg CO_2]	Remaining difference[(2)]
1990	19	472	2 704	-732	2 463	1.2%
1991	17	498	2 722	-805	2 432	1.3%
1992	15	448	2 458	-956	1 964	2.0%
1993	14	500	2 526	-675	2 365	1.3%
1994	11	476	2 767	-820	2 434	1.0%
1995	13	517	3 136	-839	2 828	1.4%
1996	12	520	2 918	-1 073	2 377	1.4%
1997	10	514	3 316	-1 017	2 823	1.6%
1998	0	506	3 214	-818	2 902	3.0%
1999	2	513	3 077	-825	2 766	2.2%
2000	5	499	3 489	-816	3 177	1.7%

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]	Total [Gg CO_2]	Remaining difference[2]
2001	3	455	3 449	-936	2 971	1.4%
2002	5	465	3 882	-1 129	3 222	0.5%
2003	5	504	3 723	-1 338	2 894	-0.5%
2004	4	505	3 652	-1 475	2 686	-0.1%
2005	5	474	4 129	-1 374	3 235	0.1%
2006	5	509	4 208	-1 486	3 235	1.6%
2007	5	447	4 216	-1 430	3 237	1.5%
2008	5	501	4 187	-1 644	3 049	1.0%
2009	5	464	3 243	-1 822	1 890	-0.8%
2010	5	512	3 980	-1 898	2 598	0.5%
2011	5	530	3 988	-2 090	2 432	0.4%
2012	5	511	3 924	-2 216	2 224	0.1%

[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.

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

4.1 Article 3 (1) d

Austria did not elect any of the 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).

For submission 2014 the following changes were carried out: The areas of the ARD activities were changed on basis of the ARD assessment that was finalized in 2013. Due to this assessment the areas of both, AR and D, are smaller than in previous submissions. The biomass stock gains and losses at the ARD lands and dead wood stock changes at the ARD lands in the Kyoto-Period were for the first time measured accurately with this ARD assessment.

These changes in the ARD activity data also led to different mean soil C stocks to be used for the estimates of the soil C stock changes on the ARD lands. Furthermore, in response to a review finding the soil C stock changes on WL subject to ARD were assumed to be 0.As the total area of WL subject to AR is higher than the total area of WL subject to D, this approach is conservative because it underestimates the net removals of both subcategories in the mineral soil pool.

In addition, in response to a review finding the emissions due to liming at D lands to CL and GL were estimated for the first time.

So, the emission estimates for the ARD lands were changed for the first Commitment Period of the Kyoto-Protocol on basis of these new activity data and emission factors. While the emissions and removals in the single activities of AR and D changed significantly, the net result of ARD represents 10% higher average annual net removals compared to previous submissions.

Article 3.3 activities are a net sink in Austria: net CO_2 removals amounted to -6 795 Gg CO_2 equivalents during the first Commitment Period of the Kyoto Protocol 2008–2012 (Afforestation and Reforestation: -10 117 Gg CO_2 equivalents; Deforestation: 3 322 Gg CO_2 equivalents).

5 ADDITIONAL REPORTING UNDER ARTICLE 7 OF REGULATION 525/2013/EC

5.1 Article 7 (1) f

Indicators pursuant to Article 7 (1) f of the Monitoring Regulation are reported as separate file (AT_Annex II_indicators_2014.xls) as well as included in Annex III. Emission data are consistent with the CRF; denominators are taken from official Austrian statistics.

5.2 Article 7 (1) g

AAUs, RMUs, ERUs or CERs issued or transferred to the Austrian registry in the reporting period 2013 can be found in the separate file SEF_AT_2014_1_14-10-56 13-1-2014.xls which is submitted together with this report.

5.3 Article 7 (1) h

No transfers pursuant to Article 3 (4) and (5) of Decision No. 406/2009/EC have been concluded in 2013.

5.4 Article 7 (1) i

The Austrian JI/CDM Procurement Programme, which has its legal basis in the Environmental Subsidies Act, foresees the purchase of up to 80 million ERUs, CERs and AAUs to cover the gap between the total emissions in the period 2008 to 2012 and the Austrian obligation according to Annex B of the Kyoto Protocol.

5.5 Article 7 (1) n

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[46].

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

5.6 Article 7 (1) o

The following changes to the national registry of Austria have occurred in 2013:

Table 14: Changes to the national registry of Austria in 2013.

Reporting Item	Description
15/CMP.1 annex II.E paragraph 32.(a) Change of name or contact	No change of the name/contact information of the registry administrator has occurred.
15/CMP.1 annex II.E paragraph 32.(b) Change regarding cooperation arrangement	No change of cooperation arrangement occurred during the reported period.
15/CMP.1 annex II.E paragraph 32.(c) Change to database structure or the capacity of national registry	An updated diagram of the database structure is attached as Annex A. Iteration 5 of the national registry released in January 2013 and Iteration 6 of the national registry released in June 2013 introduces changes in the structure of the database. Changes introduced in release 5 and 6 of the national registry were limited and only affected EU ETS functionality. No change was required to the database and application backup plan or to the disaster recovery plan. No change to the capacity of the national registry occurred during the reported period.
15/CMP.1 annex II.E paragraph 32.(d) Change regarding conformance to technical standards	Changes introduced in release 5 and 6 of the national registry were limited and only affected EU ETS functionality. However, each release of the registry is subject to both regression testing and tests related to new functionality. These tests also include thorough testing against the DES and were successfully carried out prior to the relevant major release of the version to Production (see Annex B). No other change in the registry's conformance to the technical standards occurred for the reported period.
15/CMP.1 annex II.E paragraph 32.(e) Change to discrepancies procedures	No change of discrepancies procedures occurred during the reported period.
15/CMP.1 annex II.E paragraph 32.(f) Change regarding security	No change of security measures occurred during the reporting period
15/CMP.1 annex II.E paragraph 32.(g) Change to list of publicly available information	No change to the list of publicly available information occurred during the reporting period.
15/CMP.1 annex II.E paragraph 32.(h) Change of Internet address	No change of the registry internet address occurred during the reporting period.
15/CMP.1 annex II.E paragraph 32.(i) Change regarding data integrity measures	No change of data integrity measures occurred during the reporting period.
15/CMP.1 annex II.E paragraph 32.(j) Change regarding test results	Changes introduced in release 5 and 6 of the national registry were limited and only affected EU ETS functionality. Both regression testing and tests on the new functionality were successfully carried out prior to release of the version to Production. The site acceptance test was carried out by quality assurance consultants on behalf of and assisted by the European Commission; the report is attached as Annex B.
The previous Annual Review recommendations	See below

In response to the previous Annual Review recommendations, the following document was submitted as a second addendum to Chapter 14: 'Information on changes in national registry' of the Annual Inventory Submission for the reporting year 2012.

Table 15: Second addendum to Chapter 14.

Reference	Recommendation description	Response
2.3.3	The assessor recommends that following major changes, the party provide a data model which contains all DES required entities complete with descriptions in its annual NIR.	The complete description of the consolidated registry was provided in the common readiness documentation and specific readiness documentation for the national registry of EU and all consolidating national registries. Since the successful certification of the registry on 1 June 2012, Iteration 4 of the registry, introduced in October 2012, added a limited number of new entities, none of them relating to DES entities. A data model was attached which more clearly shows the relevant entities "RECONCILIATIONS", "NOTIFICATIONS", "RESPONSES"," INTERNAL AUDIT LOG" and "MESSAGE LOG." As specified in the DES (Section VII. Data Logging Specifications/E. Message Archive), a copy of messages sent and received is stored in standalone files in one of two managed servers in the hosting environment. For that reason, the Message Archive is not shown in the model. The "MESSAGE LOG" object holds the location of the entire message, for each Message_ID. Since the successful certification of the registry on 1 June 2012, there has been no change in the capacity of the registry or change of its infrastructure.
2.3.10	The assessor strongly recommends that the Party test each release thoroughly against the DES as part of each major release cycle and provide the results of such tests in its annual NIR.	The consolidated EU system of registries successfully completed a full certification procedure in June 2012. Notably, this procedure includes connectivity testing, connectivity reliability testing, distinctness testing and interoperability testing to demonstrate capacity and conformance to the Data Exchange Standard (DES). This included a full Annex H test. All tests were executed successfully and led to successful certification on 1 June 2012 The October 2012 release (version 4.0) was only a minor iteration and changes were limited to EU ETS functionality and had no impact on Kyoto Protocol functions in the registry. The test script previously provided reflects this. However, each major release of the registry is subject to both regression testing and tests related to new functionality. These tests include thorough testing against the DES and were successfully carried out prior to the relevant major release of the version to Production.

Together with this report the following files are submitted:

- Annex A - CSEUR_DB_model_20140114.pdf
- Annex B - CR2013-v5 2- v6 1 7 1 REPORT-v3 00.xls

5.7 Article 7 (1) last sentence

Article 7 (1) foresees that Member States shall inform the Commission of any intention to make use of Article 3(4) and (5) of Decision No 406/2009/EC in the first reporting year under Regulation (EU) No 525/2013.

Austria wants to state that the use of Article 3(4) and (5) of Decision No 406/2009/EC is currently not foreseen, but Austria reserves the right to make use of the provisions contained in Article 3(4) and (5) of Decision No 406/2009/EC at a later stage.

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	2012
Total Emissions/Removals with LULUCF	**51 658.13**	**52 060.95**	**50 517.91**	**71 557.72**	**74 615.76**	**73 019.11**	**73 811.80**	**63 828.29**	**68 613.29**	**66 724.90**	**64 116.50**
Total Emissions without LULUCF	**62 017.75**	**63 924.04**	**65 992.86**	**79 392.94**	**76 633.08**	**73 980.07**	**73 811.96**	**67 665.13**	**72 506.48**	**70 541.25**	**67 889.90**
1. Energy	**54 171.69**	**56 355.11**	**58 032.82**	**70 484.56**	**67 301.85**	**64 218.32**	**63 668.76**	**59 472.43**	**63 329.65**	**61 037.54**	**58 690.75**
A. Fuel Combustion (Sectoral Approach)	54 069.60	56 227.96	57 868.17	70 279.40	67 069.69	63 981.16	63 456.60	59 207.26	63 092.48	60 804.37	58 453.57
1. Energy Industries	13 792.28	12 918.64	12 221.05	16 222.82	15 075.33	13 836.44	13 631.65	12 598.18	13 946.65	13 723.18	12 324.99
2. Manufacturing Industries and Construction	12 685.38	13 489.03	13 890.90	16 160.98	15 877.85	15 664.63	15 939.68	14 326.52	15 913.88	15 741.37	15 565.44
3. Transport	13 771.40	15 675.07	18 620.84	24 675.47	23 398.05	23 572.40	22 317.08	21 524.34	22 190.92	21 510.60	21 418.45
4. Other Sectors	13 785.55	14 112.67	13 094.59	13 176.57	12 674.42	10 863.07	11 523.02	10 712.52	10 994.76	9 782.39	9 097.29
5. Other	35.00	32.55	40.80	43.57	44.06	44.61	45.17	45.70	46.27	46.83	47.40
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	237.17
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	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	237.17
2. Industrial Processes	**7 539.87**	**7 368.01**	**7 755.15**	**8 683.13**	**9 070.35**	**9 525.56**	**9 926.42**	**8 035.18**	**8 997.90**	**9 328.47**	**9 008.12**
A. Mineral Products	3 274.18	2 862.55	2 965.71	3 132.87	3 290.69	3 517.56	3 531.12	2 915.82	2 935.73	3 029.59	2 946.15
B. Chemical Industry	540.72	563.62	568.74	534.90	566.26	504.57	567.51	522.61	581.37	605.41	587.78
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	5 693.47	5 474.20
D. Other Production	NA	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	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**	**173.21**	**189.00**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012
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	**-9 898.16**	**-11 503.58**	**-15 254.23**	**-7 645.11**	**-1 828.59**	**-773.28**	**114.91**	**-3 929.71**	**-3 918.32**	**-3 896.83**	**-3 865.28**
A. Forest Land	-10 930.15	-12 295.86	-16 033.88	-8 782.88	-2 970.76	-1 945.09	-1 052.77	-4 604.63	-4 565.50	-4 526.37	-4 487.24
B. Cropland	33.56	94.84	145.66	203.52	209.78	228.13	228.66	238.28	221.56	221.88	223.54
C. Grassland	321.74	139.73	144.61	352.53	351.68	354.17	355.05	49.23	45.69	43.46	41.24
D. Wetlands	42.08	35.81	35.80	37.17	39.32	51.30	48.93	68.78	73.40	69.77	74.84
E. Settlements	183.66	143.58	87.41	221.72	226.02	230.32	234.61	101.29	96.84	92.39	87.95
F. Other Land	450.94	378.32	366.17	322.83	315.36	307.90	300.43	217.33	209.68	202.03	194.38
G. Other	NE	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**	**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	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	2.03
D. Other	NA	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	2012
7. Other *(please specify)*	**NA**	**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**	**2 100.05**	**2 212.86**	**2 118.29**
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	2 072.66
Marine	38.72	48.17	56.66	61.97	51.99	55.38	50.62	42.27	50.50	44.42	45.63
Multilateral Operations	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**
CO_2 Emissions from Biomass	**9 927.77**	**11 454.01**	**12 477.53**	**16 553.92**	**17 540.02**	**19 358.15**	**20 828.33**	**21 578.09**	**24 126.35**	**23 522.49**	**25 166.69**

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	2012
Total Emissions/ Removals with LULUCF	**395.59**	**362.90**	**315.57**	**289.87**	**284.08**	**278.79**	**273.45**	**268.86**	**265.07**	**257.06**	**252.41**
Total Emissions without LULUCF	**395.56**	**362.89**	**315.56**	**289.86**	**284.07**	**278.78**	**273.44**	**268.85**	**265.06**	**257.05**	**252.40**
1. Energy	**32.02**	**31.27**	**25.23**	**23.83**	**22.95**	**22.46**	**22.44**	**22.21**	**23.57**	**22.13**	**22.72**
A. Fuel Combustion (Sectoral Approach)	22.06	20.50	15.17	13.35	12.19	11.57	11.70	11.04	12.01	10.67	11.36
1. Energy Industries	0.21	0.21	0.20	0.30	0.34	0.35	0.37	0.40	0.44	0.48	0.50
2. Manufacturing Industries and Construction	0.34	0.40	0.45	0.61	0.61	0.61	0.65	0.64	0.65	0.67	0.65
3. Transport	3.07	3.08	1.92	1.33	1.16	1.02	0.86	0.77	0.70	0.63	0.61
4. Other Sectors	18.44	16.81	12.60	11.11	10.08	9.58	9.82	9.22	10.22	8.89	9.60
5. Other	0.00	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	9.96	10.78	10.06	10.48	10.75	10.89	10.74	11.17	11.56	11.46	11.35
1. Solid Fuels	0.55	0.31	0.30	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
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	11.31
2. Industrial Processes	**0.71**	**0.69**	**0.70**	**0.75**	**0.92**	**0.91**	**0.89**	**0.85**	**0.87**	**0.88**	**0.87**
A. Mineral Products	NA	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	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	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	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	2012
4. Agriculture	**199.63**	**192.07**	**180.66**	**170.30**	**169.65**	**170.34**	**169.66**	**171.82**	**171.47**	**169.17**	**167.92**
A. Enteric Fermentation	178.73	172.08	162.71	153.74	153.23	153.84	153.52	155.49	155.06	153.08	152.03
B. Manure Management	20.52	19.50	17.46	16.15	15.97	16.03	15.69	15.87	15.91	15.62	15.44
C. Rice Cultivation	NO	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	0.42
E. Prescribed Burning of Savannas	NO	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	0.02
G. Other	NA	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**	**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	0.01
B. Cropland	NA,NO	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	NO
D. Wetlands	NO	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	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	NA,NO
G. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6. Waste	**163.20**	**138.86**	**108.97**	**94.98**	**90.55**	**85.08**	**80.46**	**73.98**	**69.16**	**64.88**	**60.90**
A. Solid Waste Disposal on Land	157.82	133.61	105.05	91.00	86.63	81.16	76.65	70.24	65.52	61.25	57.19
B. Waste-water Handling	4.85	4.21	2.68	1.64	1.48	1.39	1.29	1.20	1.10	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	0.00
D. Other	0.52	1.04	1.24	2.33	2.44	2.52	2.51	2.53	2.53	2.52	2.59
7. Other *(please specify)*	**NA**	**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**	**0.05**
Aviation	0.01	0.02	0.03	0.04	0.04	0.04	0.04	0.04	0.04	0.05	0.04
Marine	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012
Multilateral Operations	NO	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	2012
Total Emissions/ Removals with LULUCF	**20.06**	**21.37**	**20.35**	**17.64**	**17.75**	**17.84**	**18.44**	**17.55**	**16.78**	**17.12**	**16.93**
Total Emissions without LULUCF	**19.99**	**21.31**	**20.29**	**17.58**	**17.69**	**17.77**	**18.37**	**17.48**	**16.71**	**17.04**	**16.85**
1. Energy	**1.79**	**2.13**	**2.36**	**2.66**	**2.56**	**2.50**	**2.44**	**2.29**	**2.34**	**2.23**	**2.18**
A. Fuel Combustion (Sectoral Approach)	1.79	2.13	2.36	2.66	2.56	2.50	2.44	2.29	2.34	2.23	2.18
1. Energy Industries	0.15	0.16	0.16	0.27	0.29	0.31	0.33	0.32	0.39	0.38	0.36
2. Manufacturing Industries and Construction	0.26	0.32	0.43	0.50	0.51	0.52	0.52	0.49	0.50	0.50	0.51
3. Transport	0.62	0.87	0.98	1.08	1.00	0.95	0.85	0.79	0.75	0.69	0.66
4. Other Sectors	0.76	0.78	0.78	0.81	0.76	0.72	0.73	0.68	0.70	0.65	0.64
5. Other	0.00	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	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	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	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**	**0.17**
A. Mineral Products	NA	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	0.17
C. Metal Production	NA	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	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**	**0.47**	**0.47**

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012
4. Agriculture	**14.08**	**15.12**	**13.28**	**12.39**	**12.54**	**12.71**	**13.19**	**12.99**	**12.48**	**12.99**	**12.82**
A. Enteric Fermentation											
B. Manure Management	3.01	3.08	2.99	2.93	2.93	2.96	2.96	3.00	3.01	2.98	2.96
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	9.86
E. Prescribed Burning of Savannas	NO	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	0.00
G. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5. Land Use, Land-Use Change and Forestry	**0.07**	**0.06**	**0.06**	**0.06**	**0.06**	**0.07**	**0.07**	**0.08**	**0.08**	**0.08**	**0.08**
A. Forest Land	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B. Cropland	0.07	0.06	0.06	0.06	0.06	0.07	0.07	0.08	0.08	0.08	0.08
C. Grassland	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
D. Wetlands	NO	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	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	NA,NO
G. Other	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6. Waste	**0.43**	**0.55**	**0.83**	**1.09**	**1.15**	**1.18**	**1.18**	**1.19**	**1.20**	**1.20**	**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	0.84	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	0.00
D. Other	0.08	0.14	0.17	0.32	0.34	0.35	0.35	0.35	0.35	0.35	0.35
7. Other *(please specify)*	**NA**	**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**	**0.09**
Aviation	0.03	0.05	0.06	0.07	0.07	0.07	0.07	0.06	0.07	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	0.02

GREENHOUSE GAS SOURCE AND SINK CATEGORIES	1990 (Base year)	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012
Multilateral Operations	NO	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	2012
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**	**1 349.00**	**1 431.45**
HFC-23 (Gg)	NA,NO	0.00	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	0.06
HFC-41 (Gg)	NA,NO	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	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	0.14
HFC-134 (Gg)	NA,NO	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	0.47
HFC-152a (Gg)	NA,NO	0.08	0.60	0.20	0.25	0.25	0.09	0.13	0.13	NA,NO	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	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	0.10
HFC-227ea (Gg)	0.00	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	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	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	1.65
Emissions of PFCs (Gg CO_2 equivalent)	**1 022.65**	**68.39**	**67.46**	**125.04**	**136.94**	**183.72**	**167.13**	**28.64**	**63.93**	**60.07**	**40.46**
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	IE,NA,NO
C_2F_6 (Gg)	0.01	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_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	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	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	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	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	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	40.46
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**	**326.18**
SF_6 (Gg)	0.02	0.05	0.03	0.02	0.02	0.02	0.02	0.01	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 2012 submission. Sources of uncertainties are explained in the NIR 2013. The key source analysis of the 2014 submission will be presented in the NIR 2014[47].

Table A.II: Uncertainties for Key Sources of the Austrian GHG Inventory including LULUCF (KS Assessment 2013).

IPCC Source category	Gas	AD	EF	Combined	Combined as % of total national emissions in 2011	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	0.12	0.21
1.A.1.a liquid: Public Electricity and Heat Production	CO_2	0.5	0.5	0.7	0.00	0.01
1.A.1.a other: Public Electricity and Heat Production	CO_2	10.0	20.0	22.4	0.33	0.38
1.A.1.a solid: Public Electricity and Heat Production	CO_2	0.5	0.5	0.7	0.04	0.05
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.a gaseous: Iron and Steel	CO_2	5.0	0.5	5.0	0.08	0.13
1.A.2.a liquid: Iron and Steel	CO_2	1.0	0.5	1.1	0.01	0.01
1.A.2.a solid: Iron and Steel	CO_2	1.0	0.5	1.1	0.06	0.09
1.A.2.b gaseous: Non-ferrous Metals	CO_2	5.0	0.5	5.0	0.01	0.02
1.A.2.c gaseous: Chemicals	CO_2	5.0	0.5	5.0	0.05	0.08
1.A.2.c other: Chemicals	CO_2	10.0	20.0	22.4	0.10	0.08
1.A.2.d gaseous: Pulp, Paper and Print	CO_2	5.0	0.5	5.0	0.11	0.18
1.A.2.d liquid: Pulp, Paper and Print	CO_2	1.0	0.5	1.1	0.00	0.01
1.A.2.d solid: Pulp, Paper and Print	CO_2	1.0	0.5	1.1	0.01	0.01
1.A.2.e gaseous: Food Processing, Beverages and Tobacco	CO_2	5.0	0.5	5.0	0.04	0.07
1.A.2.e liquid: Food Processing, Beverages and Tobacco	CO_2	1.0	0.5	1.1	0.00	0.00

[47] Austria’s National Inventory Report 2014, 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 2011	Introduced into the trend in total national emissions
		Uncertainty [%]				
1.A.2.f gaseous: Other	CO_2	5.0	0.5	5.0	0.13	0.22
1.A.2.f liquid: Other	CO_2	1.0	0.5	1.1	0.03	0.04
1.A.2.f other: Other	CO_2	10.0	20.0	22.4	0.14	0.16
1.A.2.f solid: Other	CO_2	1.0	0.5	1.1	0.01	0.01
1.A.3.b diesel oil: Road Transportation	CO_2	3.0	3.0	4.2	0.88	1.12
1.A.3.b gasoline: Road Transportation	CO_2	3.0	3.0	4.2	0.28	0.39
1.A.3.e gaseous: Other	CO_2	2.0	0.5	2.1	0.01	0.02
1.A.4.a gaseous: Commercial/Institutional	CO_2	5.0	0.5	5.0	0.13	0.21
1.A.4.a liquid: Commercial/Institutional	CO_2	1.0	0.5	1.1	0.01	0.02
1.A.4.a other: Commercial/Institutional	CO_2	10.0	20.0	22.4	0.00	0.13
1.A.4.b biomass: Residential	CH_4	10.0	50.0	51.0	0.11	0.16
1.A.4.b gaseous: Residential	CO_2	5.0	0.5	5.0	0.18	0.30
1.A.4.b liquid: Residential	CO_2	1.0	0.5	1.1	0.06	0.09
1.A.4.b solid: Residential	CO_2	1.0	0.5	1.1	0.00	0.02
1.A.4.c liquid: Agriculture/Forestry/Fisheries	CO_2	1.0	0.5	1.1	0.01	0.02
2.A.1: Cement Production	CO_2	1.1	2.0	2.3	0.05	0.05
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	0.04	0.02
2.B.2: Nitric Acid Production	N_2O	2.0	5.0	5.4	0.00	0.08
2.C.1: Iron and Steel Production	CO_2	0.5	0.5	0.7	0.05	0.06
2.C.3: Aluminium production	PFCs	2.0	50.0	50.0	0.00	0.95
2.C.4: SF_6 Used in Al and Mg Foundries	SF_6	0.0	5.0	5.0	0.00	0.02
2 F 1: Refrigeration and Air Conditioning Equipment	HFC	20.0	50.0	53.9	0.92	1.16
2.F.9: Other Sources of SF_6	SF_6	25.0	50.0	55.9	0.18	0.16
3.D: OTHER	N_2O	5.0	20.0	20.6	0.04	0.04
4.A.1: Cattle	CH_4	10.0	20.0	22.4	0.89	0.75
4.B.1: Cattle	CH_4	10.0	50.0	51.0	0.15	0.10
4.B.1: Cattle	N_2O	10.0	100.0	100.5	0.97	0.29
4.D.1: Direct Soil Emissions	N_2O	5.0	150.0	150.1	3.68	0.89
4.D.3: Indirect Emissions	N_2O	5.0	150.0	150.1	2.26	1.02

IPCC Source category	Gas	AD	EF	Com-bined	Combined as % of total national emissions in 2011	Introduced into the trend in total national emissions
		Uncertainty [%]				
5.A.1: Forest land remaining forest land	CO_2			547.0	-21.39	0.00
5.A.2: Land converted to forest land	CO_2			94.0	-2.96	0.00
5.B.2: Land converted to crop land	CO_2			225.0	1.37	0.00
5.C.2: Land converted to grassland	CO_2			572.0	2.72	0.00
5.D.2: Land converted to Wetlands	CO_2			184.0	0.86	0.00
5.E.2: Land converted to Settlements	CO_2			346.0	1.17	0.00
5.F.2: Land converted to Other land	CO_2			905.0	3.97	0.00
6.A: Solid Waste Disposal on Land	CH_4	12.0	25.0	27.7	0.46	1.06
6.B: Wastewater Handling	N_2O	20.0	50.0	53.9	0.19	0.16
Total					**22.7**	**2.80**

ANNEX III: INDICATORS

This Annex presents the indicators pursuant to Article 7 (1) f of the Regulation No. 525/2013/EC 'Monitoring Mechanism Regulation'; MMR, 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).[48]

Table A.III: Indicators pursuant to Article 7 (1) f of the Regulation No. 525/2013/EC 'Monitoring Mechanism Regulation' (MMR) for the years 1990, 1995, 2000, 2005–2012.

No	Indicator	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012
	Priority											
1	Total CO_2 intensity of GDP [t CO_2/Mio Euro]	358.2	330.8	292.5	323.7	301.4	280.6	276.0	263.1	277.0	262.0	250.0
2	Energy related CO_2 intensity of GDP [t CO_2/Mio Euro]	312.3	291.0	256.4	286.6	263.8	242.7	237.3	230.2	241.0	225.9	215.3
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	159.8	156.1	152.7	149.5
4	Energy related CO_2 intensity of industry [t/Mio Euro]	290.1	284.6	256.0	275.5	257.6	238.0	243.2	251.7	264.6	246.8	242.1
5	Specific CO_2 emissions of households [t CO_2/dwelling]	3.40	3.17	2.76	2.52	2.30	2.02	2.06	1.96	2.15	1.91	1.87
6	CO_2 intensity of the commercial and institutional sector [t CO_2/Mio Euro]	25.12	28.55	22.63	23.39	23.99	17.70	20.26	17.86	14.88	11.93	8.64
7	Specific CO_2 emissions of public and autoproducer power plants [t CO_2/TJ]	166.8	150.9	128.6	122.5	121.1	117.3	106.3	97.7	100.7	103.8	101.3
	Additional Priority											
1	Freight transport on road [g CO_2/ ton-km]	140.6	120.5	94.6	87.7	87.2	84.8	83.6	83.2	79.8	80.0	79.0
2	Total CO_2 intensity – iron and steel industry [t CO_2/Mio Euro]	2 651	3 193	2 525	3 486	3 654	3 465	3 655	3 356	3 935	3 635	3 645
3	Energy related CO_2 intensity – chemical industry [t CO_2/Mio Euro]	575.2	532.8	492.1	516.3	413.3	326.8	431.9	389.7	351.2	388.0	397.4

[48] 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	2012
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	771.7	710.7	689.6	661.3
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	1.85	1.74	1.71	1.68
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	0.185
	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	149.6	147.3
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	169.1	161.7	157.1	152.7
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	133.5	130.9	128.6
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	86.0
5	Energy related CO_2 intensity – food, drink and tobacco industry [t CO_2/Mio Euro]	234.2	181.7	169.7	174.2	163.8	134.5	140.9	171.0	171.9	151.0	155.8
6	Energy related CO_2 intensity – paper and printing industry [t CO_2/Mio Euro]	864.7	803.4	662.6	616.2	546.1	512.9	531.7	576.6	606.8	534.1	538.1
7	Specific CO_2 emissions of households for space heating [t CO_2/m²]	33.84	30.32	25.46	22.64	20.43	17.81	18.07	17.12	18.67	16.51	16.11
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	NA
9	Specific CO_2 emissions of public power plants [t CO_2/TJ]	166.4	143.5	133.3	111.8	109.8	102.7	93.5	84.0	82.6	86.3	82.6
10	Specific CO_2 emissions of autoproducer plants [t CO_2/TJ]	168.2	168.2	117.6	160.8	156.5	157.6	145.1	140.9	160.0	153.1	145.8
11	Carbon intensity of total power generation [t CO_2/TJ]	68.37	59.04	48.19	59.03	57.21	53.67	48.88	42.95	49.53	52.00	42.52
12	Carbon intensity of transport [t CO_2/TJ]	65.94	64.06	63.61	65.06	62.51	61.71	60.36	60.45	60.55	60.18	60.87

No	Indicator	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012
13	Specific energy related CO_2 emissions of paper industry [t CO_2/t production]	0.755	0.643	0.543	0.463	0.420	0.421	0.425	0.486	0.469	0.417	0.395
14	Carbon intensity in Industry [kt CO_2 /PJ]	58.58	61.76	54.77	53.25	51.71	50.24	49.98	46.80	48.39	46.64	46.91
15	Carbon intensity Households [kt CO_2 /PJ]	40.92	37.51	34.91	31.19	30.05	27.96	27.88	26.79	27.16	26.52	25.00

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In "Austria's Annual Greenhouse Gas Inventory 1990–2012" the Umweltbundesamt presents updated figures of greenhouse gas (GHG) emissions in Austria. In 2012, the last year of the first commitment period under the Kyoto Protocol, GHG emissions amounted to 80.2 million tonnes of CO_2 equivalents. This corresponds to a 2.8% increase against the base-year level and a 3.3% decrease compared to 2011. The key driver for the emissions decline from 2011 to 2012 was the decreasing consumption of fossil fuels and the increased use of hydro power for electrical power generation.

Content and format of this report are in accordance with the obligations under the greenhouse gas monitoring mechanism (Regulation 525/2013/EC). Emission data have to be reported yearly to the European Commission by 15 January, a complete, up-to-date National Inventory Report (NIR) has to be submitted by 15 March.

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