umweltbundesamt

AUSTRIA'S NATIONAL AIR EMISSION INVENTORY 1990 – 2004

Submission under Directive 2001/81/EC

REPORT
REP-0005

Vienna, 2006

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ZUSAMMENFASSUNG

Dieser Bericht präsentiert die neueste Entwicklung jener Luftschadstoffe, für die es nationale Emissionshöchstgrenzen gibt. Er folgt in Format und Inhalt den verbindlichen Anforderungen der EU-Richtlinie 2001/81/EG über nationale Emissionshöchstmengen für bestimmte Luftschadstoffe, nach der englischen Bezeichnung "national emission ceilings" auch als "NEC-Richtlinie" bekannt.

In der NEC-Richtlinie sind für die einzelnen Mitgliedstaaten verbindliche nationale Emissionshöchstgrenzen für Schwefeldioxid (SO_2), Stickoxide (NO_x), flüchtige organische Verbindungen ohne Methan (NMVOC) und Ammoniak (NH_3) ab dem Jahr 2010 festgelegt.

Die NEC-Richtlinie wurde in Österreich mit dem Emissionshöchstmengengesetz-Luft (EG-L, BGBL. I Nr. 34/2003) in nationales Recht umgesetzt; das EG-L trat am 12. Juni 2003 in Kraft.

Artikel 7 in Verbindung mit Annex III der NEC-Richtlinie legt fest, dass für diese Luftschadstoffe eine jährliche Inventur zu erstellen ist, die den im Rahmen des UNECE-Übereinkommens über weiträumige grenzüberschreitende Luftverunreinigung (CLRTAP) beschlossenen Inventurregeln entspricht.

Emissionstrend

Die folgende Tabelle zeigt den Trend der nationalen Gesamtemissionen ab dem Jahr 1990 bis 2004 in Tausend Tonnen Gesamtmasse.

Tabelle: Emissionstrends von SO_2, NO_x, NMVOC und NH_3 1990–2004.

	Nationale Gesamtemissionen gemäß UN-Übereinkommen über weiträumige grenzüberschreitende Luftverunreinigung [Gg]						
	1990	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**
SO_2	74,23	46,82	31,50	32,86	32,83	33,38	28,89
NO_X	211,59	192,58	203,90	213,18	219,73	230,01	226,91
NMVOC	284,37	220,66	179,15	182,04	176,09	175,38	172,20
NH_3	68,65	70,43	65,58	65,34	64,17	64,80	63,84

Diese nationalen Gesamtemissionen wurden auf Basis der in Österreich verkauften Treibstoffe errechnet. Dabei ist zu beachten, dass in Österreich in den letzten Jahren ein beachtlicher Teil der verkauften Treibstoffmenge im Inland getankt, jedoch im Ausland verfahren wurde (so genannter Tanktourismus ins Inland).

Gemäß Artikel 2 (1) der NEC-Richtlinie gilt die Richtlinie für Emissionen von Schadstoffen im Gebiet der Mitgliedstaaten. Die folgende Tabelle zeigt daher die österreichischen Gesamtemissionen ohne Tanktourismus für einen Vergleich mit den Nationalen Emissionshöchstmengen der NEC-Richtlinie. Diese Emissionen sind Österreichs offizielle Inventurdaten gemäß Artikel 8 (1) der NEC-Richtlinie. Aus Gründen der Vergleichbarkeit und Konsistenz mit anderen Berichtspflichten bleiben die Tabellen der Nationalen Gesamtemissionen im Anhang aber unverän-

dert; es wird ihnen jedoch eine zusätzliche Tabelle mit den Emissionen ohne Tanktourismus vorangestellt, um einen Vergleich mit den Nationalen Emissionshöchstmengen zu ermöglichen.

Tabelle: Österreichs NEC-Gas-Emissionen 1990–2004 und Ziele 2010 gemäß NEC-Richtlinie 2001/81/EC.

	Emissionen in Tausend Tonnen [Gg]							Emissions-höchstmenge
	1990	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**	**2010**
SO_2	74,78	46,65	31,05	32,29	32,15	32,62	28,22	39
NO_X	221,26	190,18	171,93	171,69	168,47	168,91	164,19	103
NMVOC	284,62	221,02	178,03	180,03	172,87	171,38	168,14	159
NH_3	68,65	70,48	65,62	65,29	63,96	64,51	63,54	66

Alle vier dieser so genannten NEC-Gase nehmen 2004 gegenüber dem Vorjahr ab. Die größte Abweichung zur festgesetzten nationalen Emissionshöchstmenge 2010 ist derzeit bei den Stickoxiden zu verzeichnen, in erster Line aufgrund hoher Emissionen im Straßenverkehr.

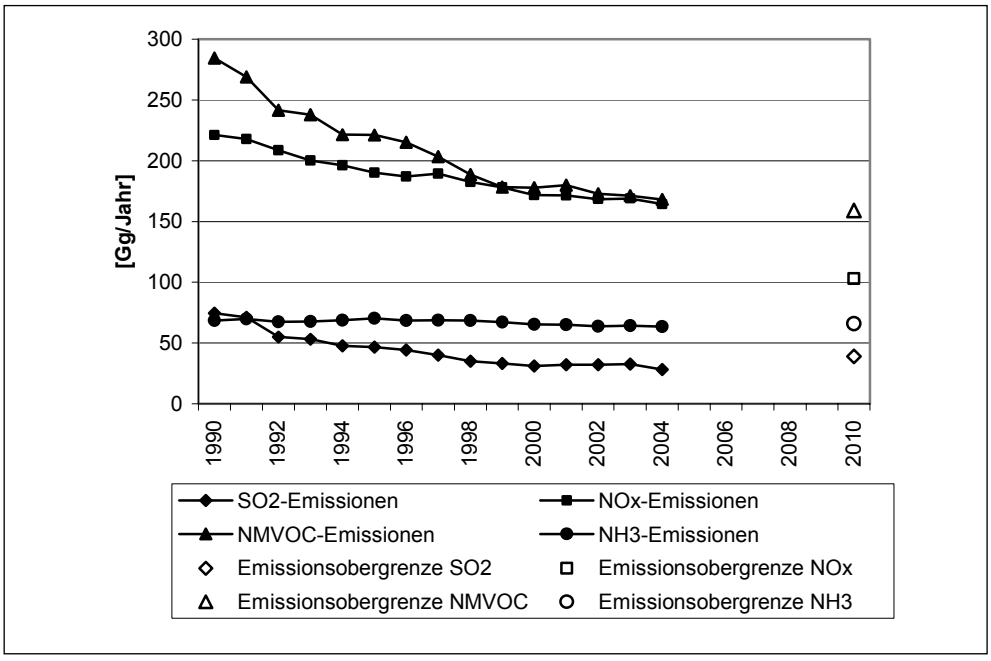

Abbildung: NEC-Gas-Emissionen ohne Tanktourismusanteile und Ziele gemäß NEC-Richtlinie 2001/81/EC.

SO_2-Emissionen

Die in der NEC-Richtlinie festgesetzte Emissionshöchstmenge für SO_2 von 39.000 Tonnen im Jahr 2010 wird in Österreich bereits seit mehreren Jahren unterschritten. Im Zeitraum 1990 bis 2004 konnten die SO_2-Emissionen (ohne Tanktourismusanteile) um beachtliche 62 % reduziert werden.

NO_x-Emissionen

Im Zeitraum 1990 bis 2004 sind die NO_x-Emissionen (ohne Tanktourismusanteile) um 26 % gesunken. Mit 164.000 Tonnen im Jahr 2004 sind die Stickoxidemissionen jedoch noch immer beträchtlich über der in der NEC-Richtline festgesetzten Emissionshöchstmenge von 103.000 Tonnen im Jahr 2010.

NMVOC-Emissionen

Mit einer Reduktion um 41 % seit 1990 und dem ermitteltem Ausstoß von 168.000 Tonnen im Jahr 2004 haben sich die NMVOC-Emissionen (ohne Tanktourismusanteile) entscheidend dem NEC-Ziel 2010 von 159.000 Tonnen angenähert.

NH_3-Emissionen

Die in der NEC-Richtlinie festgesetzte Emissionshöchstmenge für NH_3 von 66.000 Tonnen im Jahr 2010 wird derzeit unterschritten. Von 1990 bis 2004 konnten die NH_3-Emissionen (ohne Tanktourismusanteile) um 7 % auf 63.500 Tonnen reduziert werden.

Datengrundlage

Anhang III der NEC-Richtlinie sieht die Erstellung der Inventur unter Anwendung jener Verfahren vor, welche im Rahmen des Übereinkommens über weiträumige grenzüberschreitende Luftverunreinigung vereinbart wurden. Zur Ermittlung der Daten wurde das gemeinsame Handbuch von EMEP/CORINAIR[1] angewandt. Die Darstellung erfolgt im NFR-Format[2] der UNECE.

In den gültigen Richtlinien zur Emissionsberichterstattung ist den einzelnen Staaten die Möglichkeit gegeben, die Emissionen vom Straßenverkehr entweder auf Basis des verkauften Treibstoffs (fuel sold) oder auf Basis des verbrauchten Treibstoffes (fuel consumed) zu berichten.

Emissionen des Tanktourismus

In der Österreichischen Luftschadstoff-Inventur (OLI) basieren die Emissionsberechnungen des Straßenverkehrs auf der in Österreich verkauften Treibstoffmenge.

Im Jahr 2004 wurde vom Lebensministerium eine Studie veröffentlicht, in welcher die Auswirkungen des Tanktourismus auf den Treibstoffverbrauch und die Entwicklung der verkehrsbedingten Emissionen in Österreich abgeschätzt wurden.

Tanktourismuseffekte[3] entstehen durch unterschiedliche Treibstoffpreise in den unterschiedlichen Ländern. Ist der Treibstoffpreis so wie in den vergangenen Jahren in Österreich niedriger als im benachbarten Ausland, wird teilweise in Österreich getankt, der Treibstoff aber im Ausland „verfahren“. In den 90er Jahren konnte dieser Effekt aufgrund höherer Treibstoffpreise in Österreich umgekehrt beobachtet werden (siehe folgende Tabelle).

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[1] EMEP/CORINAIR Emission Inventory Guidebook. Third edition. Prepared by the EMEP Task Force on Emission Inventories. October 2002 update. Internet site: http://reports.eea.eu.int

[2] **N**omenclature **F**or **R**eporting

[3] Der Tanktourismus stellt im Wesentlichen die Differenz von Treibstoffabsatz und Treibstoffverbrauch in Österreich dar

Tabelle: Emissionen aus Tanktourismus (Angaben in Tausend Tonnen [Gg]).

Emission	1990	1995	2000	2001	2002	2003	2004
SO_2	–0,55	0,17	0,45	0,57	0,68	0,76	0,67
NO_X	–9,67	2,40	31,98	41,49	51,26	61,09	62,72
NMVOC	–0,25	–0,36	1,12	2,01	3,22	4,00	4,06
NH_3	0,00	–0,05	–0,04	0,05	0,21	0,29	0,30

Die Tabelle zeigt, dass im Jahr 2004 etwa 28 % der Nationalen Gesamtemissionen an NO_x auf Tanktourismuseffekte zurückzuführen sind.

Die Österreichische Luftschadstoff-Inventur

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 konsistente Zeitreihe zur Verfügung zu haben. Die in diesem Bericht dargestellten Emissionsdaten ersetzen somit die publizierten Daten vorhergehender Berichte.

Die folgende Tabelle fasst den Stand der Daten und das Berichtsformat des vorliegenden Berichtes zusammen.

Tabelle: Datengrundlage des vorliegenden Berichts.

Inventur	Datenstand	Berichtsformat
OLI 2005	Dezember 2005	NFR-Format der UNECE

Der vorliegende Bericht wurde vom Umweltbundesamt auf Grundlage des Umweltkontrollgesetzes BGBl. Nr. 152/1998 erstellt. Der Umweltbundesamt GmbH wird in diesem Bundesgesetz in § 6 (2) Z. 19 unter anderem die Aufgabe übertragen, an der Erfüllung der Berichtspflichten an die Europäische Kommission gemäß Richtlinien und Entscheidungen der EG mitzuwirken. 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.

Im Anschluss an diese Zusammenfassung wird der von der Republik Österreich an die Europäische Kommission zu übermittelnde Emissionsbericht in englischer Sprache wiedergegeben. Es handelt sich hierbei um eine Beschreibung der wichtigsten Daten mit Anführung der wesentlichsten methodischen Änderungen. Der Anhang enthält Überblickstabellen für die Schadstoffe SO_2, NO_2, NH_3, und NMVOC. Der vollständige Datensatz wird der Europäischen Kommission im NFR-Format der UNECE in digitaler Form übermittelt, wobei diesem Datensatz eine Tabelle mit den Emissionen ohne Tanktourismus vorangestellt wurde, um einen Vergleich mit den Nationalen Emissionshöchstmengen zu ermöglichen.

AUSTRIA'S NATIONAL AIR EMISSION INVENTORY 1990 - 2004

Submission under Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants

Vienna, February 2006 (revised version)

Prepared by Umweltbundesamt

Title of Inventory	Austria's National Air Emission Inventory 1990-2004 for acidifying and eutrophying emissions and ozone precursors. Submission under Directive 2001/81/EC. Revised version, February 2006.
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TABLE OF CONTENTS

1 INTRODUCTION

This report presents a summary of Austria's Annual National Air Emission Inventory 1990-2004 for acidifying and eutrophying emissions and ozone precursors. The inventory is submitted to the European Commission by the Austrian Federal Government in fulfilment of Austria's annual reporting obligation under Directive 2001/81/EC of the European Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants.

The basis of this report is the Austrian air emission inventory 2005 (Österreichische Luftschadstoff-Inventur, OLI 2005) prepared by the Umweltbundesamt for the years 1980 to 2004. According to Article 7 and Annex III of the Directive 2001/81/EC, the Member States shall establish emission inventories and projections using the methodologies agreed upon by the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP). Thus they are requested to use the joint EMEP/CORINAIR[4] guidebook in preparing these inventories and projections.

In 2002 the Executive Body adopted new guidelines for estimating and reporting emission data to further improve transparency, consistency, comparability, completeness and accuracy of reported emissions. These guidelines define the format for reporting emission data (Nomenclature For Reporting / NFR) and offer guidance on how to provide supporting documentation. They specify minimum and additional reporting obligations.

Annex 1 of this report presents trend tables of SO_x, NO_x, NH_3 and NMVOC for the main NFR sectors as reported to the UNECE Convention on Long-range Transboundary Air Pollution. The complete tables of the NFR Format are uploaded to the Central Data Repository of the EIONET in digital form (excel files).

[4] EMEP/CORINAIR Emission Inventory Guidebook. Third edition. Prepared by the EMEP Task Force on Emission Inventories. October 2002 update. Internet site: http://reports.eea.eu.int

2 EMISSION TRENDS

In the 2002 Emission Reporting Guidelines, Parties are given the choice of whether to report emissions on the basis of fuel used or fuel sold to the final consumer. It is recommended that they should clearly state the basis of their calculations in their submissions.

Austria's national total emissions 1990-2004 according to CLRTAP reporting

Table 1 shows national total emissions as reported to the UNECE Convention on Long-range Transboundary Air Pollution, based on fuel sold.

Table 1: Austria's national total emissions 1990-2004 according to CLRTAP reporting

	National Total Emissions [Gg]						
	1990	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**
SO_2	74,23	46,82	31,50	32,86	32,83	33,38	28,89
NO_X	211,59	192,58	203,90	213,18	219,73	230,01	226,91
NMVOC	284,37	220,66	179,15	182,04	176,09	175,38	172,20
NH_3	68,65	70,43	65,58	65,34	64,17	64,80	63,84

As can be seen in Table 1 the major reductions from 1990 to 2004 were achieved in SO_2 and NMVOC emissions (-61% and -39%).

In 2004 national total emissions of NH_3 were about 7% below the level of 1990, NO_x emissions were about 7% above the level of 1990 (see Figure 1).

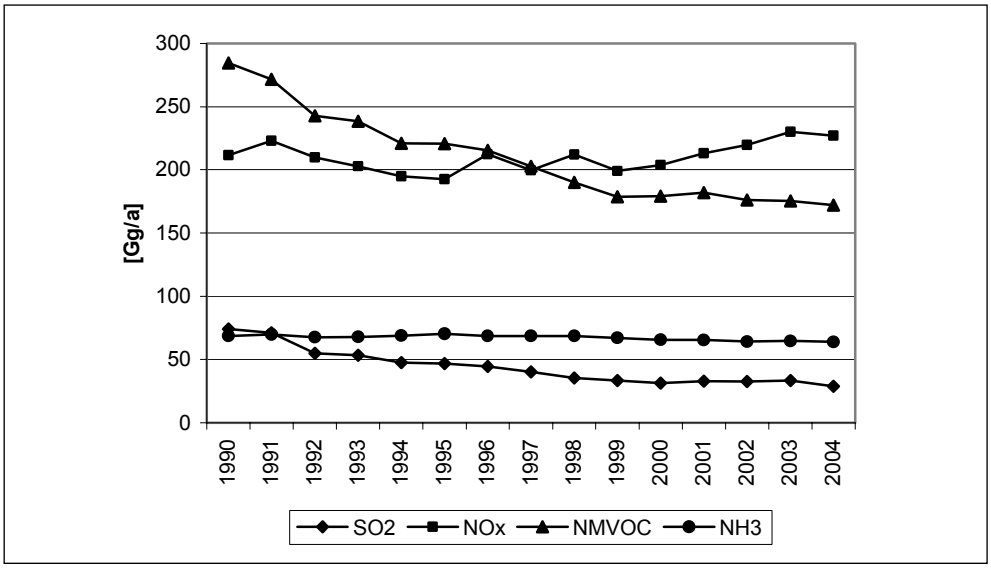

Figure 1: Trends of SO_2, NO_x, NMVOC and NH_3 emissions according to CLRTAP reporting

The increase of NO_x emissions from 1995 onwards has been caused by the so-called 'tank tourism' of the sector road transport (see Chapter 6, Table 6 'NEC gas emissions from tank tourism').

Austria's emissions 1990-2004 according to Directive 2001/81/EC and ceilings for 2010

According to Article 2 of Directive 2001/81/EC the Directive covers 'emissions on the territory of the Member States'. If fuel prices vary considerably in neighbouring countries, fuel sold within the territory of a Member State will be used outside its territory (the so-called 'tank tourism'). Austria has experienced a considerable amount of 'tank tourism' in the last few years; this needs to be taken into account for reporting emissions on the Austrian territory. For this reason Austria is reporting National Totals without 'tank tourism' according to Table 2 as Austria's official inventory under Article 8 (1) of the Directive. Details regarding 'tank tourism' are presented in Chapter 6.

Table 2: Austria's emissions 1990-2004 according to Directive 2001/81/EC and ceilings for 2010

	Emissions without 'tank tourism' [Gg]							Ceilings 2010 [Gg]
	1990	**1995**	**2000**	**2001**	**2002**	**2003**	**2004**	**2010**
SO_2	74,78	46,65	31,05	32,29	32,15	32,62	28,22	39
NO_X	221,26	190,18	171,93	171,69	168,47	168,91	164,19	103
NMVOC	284,62	221,02	178,03	180,03	172,87	171,38	168,14	159
NH_3	68,65	70,48	65,62	65,29	63,96	64,51	63,54	66

Figure 2 shows the trends of Austria's NEC emissions according to Directive 2001/81/EC without 'tank tourism'

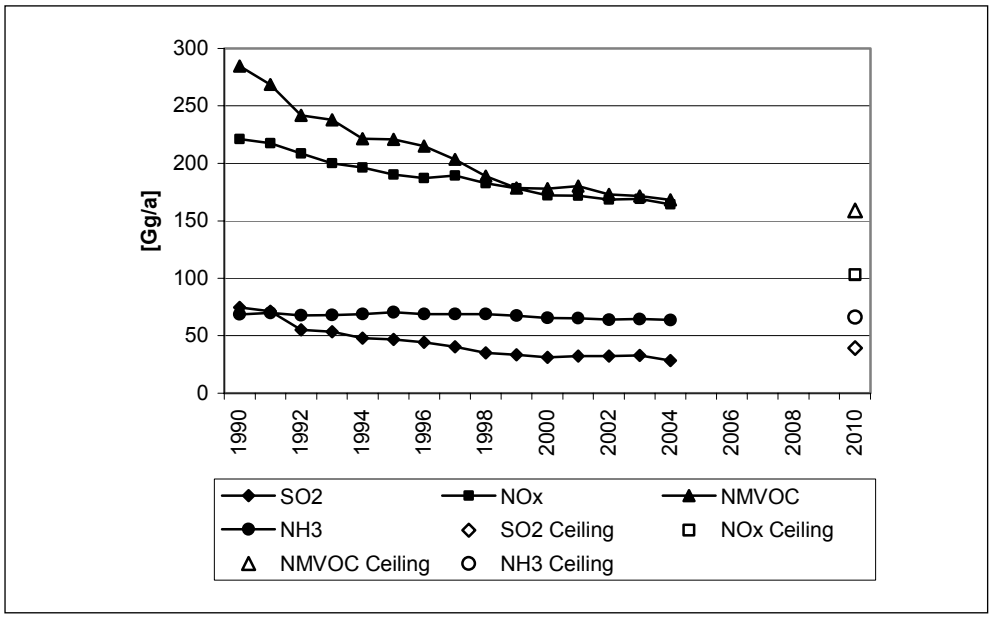

Figure 2: Trends of SO_2, NO_x, NMVOC and NH_3 emissions without 'tank tourism' and NEC emission ceilings

SO_2 Emissions

In 1990 SO_2 Emissions without 'tank tourism' amounted to 75 Gg; emissions have decreased steadily since then and by 2004 emissions were reduced by 62% mainly due to lower emissions from residential heating, combustion in industries and energy industries.

The 2010 national emission ceiling for SO_2 emissions in Austria as set out in the NEC Directive is 39 Gg. In the last seven years, Austrian total SO_2 emissions were already below the ceiling; 2004 they amounted to 28 Gg.

NO_X Emissions

In 1990 NO_X Emissions without 'tank tourism' amounted to 221 Gg and were about 26% below the level of 1990 in 2004.

The 2010 national emission ceiling for NO_X emissions in Austria as set out in the NEC Directive is 103 Gg. With 164 Gg in 2004, emissions in Austria are at the moment well above this ceiling.

NMVOC Emissions

In 1990 NMVOC Emissions without 'tank tourism' amounted to 285 Gg; emissions have decreased steadily since then and by 2004 emissions were reduced by 41%.

The national emission ceiling 2010 for NMVOC emissions in Austria as set out in the NEC Directive is 159 Gg. Assuming a linear path is followed, Austria is going to meet the target.

NH_3 Emissions

In 1990 NH_3 Emissions without 'tank tourism' amounted to 69 Gg; in 2004 emissions were 7% below 1990 levels.

The national emission ceiling of 2010 for NH_3 emissions in Austria as set out in the NEC Directive is 66 Gg. With 63.5 Gg NH_3 in 2004, emissions in Austria are at the moment below this ceiling.

3 RELATION TO DATA REPORTED EARLIER

As a result of the continuous improvement of Austria's National Air Emission Inventory, emissions of some sources have been recalculated based on updated data or revised methodologies, thus emission data for 1990 to 2003 submitted this year differ from data reported previously.

The figures presented in this report replace data reported earlier by the Umweltbundesamt under the reporting framework of the UNECE/LRTAP Convention and NEC Directive of the European Union.

Table 3: Recalculation difference of Austria's NEC gas emissions compared to the previous submission

	1990	2003
	Recalculation Difference [%]	
SO_2	-3%	-2%
NO_x	0%	0%
NMVOC	-1%	-4%
NH_3	20%	19%

The most important revisions with respect to data submitted last year are the revision of Austrian N excretion values of the Austrian livestock as well as the recalculation of the NH_3 emission factor for housing and storage. Both have led to significantly higher NH_3 emissions from the Sector Agriculture for the whole time series.

The 4% decrease of NMVOC emissions for 2003 compared to the previous submission is mainly due to the revision of emission factors and a down-revised solid biomass consumption of residential space heating (category *1 A 4*).

The 2% decrease of SO_2 emissions for 2003 is mainly due to the revision of emissions from coal combustion in the chemical industry (catgory *1 A 2 c*)

A description of these recalculations by sector is given in Chapter 5.

4 SOURCES OF DATA

The following table presents the main data sources used for activity data as well as information on who carried out the actual calculations:

Table 4: Main data sources for activity data and emission values

Sector	Data Sources for Activity Data	Emission Calculation
Energy	Energy Balance from Statistik Austria, Steam boiler database;	Umweltbundesamt, operator reports
Industry	National production statistics, import/export statistics, direct information from industry or associations of industry;	Umweltbundesamt, operator reports
Waste	Landfill database	Umweltbundesamt
LUCF	National forest inventory obtained from the Austrian Federal Office and Research Centre for Forests	Umweltbundesamt
Solvent	Import/ export statistics, production statistics, consumption statistics;	Umweltbundesamt Based on a study by: Forschungsinstitut für Energie und Umweltplanung, Wirtschaft und Marktanalysen GmbH and Institut für industrielle Ökologie[5]
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

The main sources for emission factors are:

- National studies for country-specific emission factors
- Plant-specific data reported by plant operators
- EMEP/CORINAIR Guidebook

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

5 METHODOLOGICAL CHANGES WITH RESPECT TO THE PREVIOUS SUBMISSION

This chapter describes the methodological changes by sector made to the inventory since the previous submission.

ENERGY (1A)

Update of activity data:

Cross-sectoral:

Coke oven coke net calorific values from 1990 to 1992 and 1990 to 2003 are adjusted. Consumption of gasworks gas 1990 to 1995 is considered additionally in subcategories *1 A 2 f* and *1 A 4*.

1 A 1 a Public Electricity and Heat Production:

Natural gas consumption 1997 and biomass consumption 2003 increased due to changes of the national energy balance. Consumption of biomass and industrial waste decreased from 1992 to 2003 due to elimination of double counting.

1 A 1 b Petroleum Refining:

Liquid fuels consumption 1990 to 1992 increased following changes of the national energy balance. From 1999 to 2001 liquid fuel consumption increased due to adaptation to plant-specific data.

1 A 1 c Manufacture of Solid Fuels and Other Energy Industries:

Transformation losses from gasworks for 1990 to 1995 are now considered in this category. Natural gas consumption of *Other Energy Industries* 1991 to 1995 has changed due to changes of the national energy balance.

1 A 2 a Iron and Steel:

Coke oven gas consumption (included in solid fuels) is adjusted to CO_2 emissions of integrated steel plants not considered elsewhere. Coke oven coke consumption for blast furnaces is updated for 2003.

1 A 2 b, c, d, e Manufactoring Industries and Construction:

The minor changes of each subcategory are due to changes of the energy balance, mainly due to shifts between categories. Final consumption of gasworks gas 1990 to 1995 which is not considered in the energy balance reported to EUROSTAT/IEA is considered additionally in the specific subcategories as specified in the "Austrian energy balance".

1 A 2 f Manufacturing Industries and Construction - Other:

Consumption of hard coal 1990 to 1993 is moved from *1 A 4 Other Sectors* to "Non metallic Mineral Products Industry" according to cement industry emissions declarations.

1 A 3 b Transport – Road Transportation:

Update of the statistical data for light-duty and heavy-duty vehicles (new splitting by Statistics Austria) from 1990 to 2003

1 A 3 e Other Transportation - pipeline compressors:

Update of 2003 natural gas consumption according to the updated national energy balance.

1 A 4 stationary:

Natural gas consumption is moved from or to other subcategories of *1 A Fuel Consumption* according to the updated energy balance. Consumption of gas works gas is considered additionally. Solid biomass consumption from 2000 to 2003 is adjusted, which follows the changes of the national energy balance.

Improvements of methodologies and emission factors:

1 A 1 a Public Electricity and Heat Production:

For plants > 50 MW_{th} update of SO_2 and NO_X emissions for 2003 by means of the steam boiler database. For 1990, 1991 and 1999 gap filling of SO_2 and NO_X emissions declarations for plants > 50 MW_{th}.

1 A 1 b Petroleum Refining:

Update of 2003 emissions with plant-specific measurement data.

1 A 2 c Chemicals:

Update of SO_2 and NO_X emissions from combustion of hard coal, industrial waste and solid biomass and update of SO_2 emissions from combustion of black liquor by means of plant-specific data and a study on NO_X emissions from industrial combustion.

1 A 2 d Pulp, Paper and Print:

Update of total SO_2 emissions for 2002 and 2003 according to emissions reported by the association of paper industry. Update of 2001 to 2003 NO_X emissions from solid biomass and black liquor.

1 A 2 f Manufacturing Industry and Construction - Other:

Update of 2003 SO_2, NO_X and NMVOC emissions from cement industry according to a new study based on plant-specific measurement data.

1 A 3 a Civil Aviation:

The splitting of the energy data into national and international aviation of 2003 and 2004 has been updated according to the energy balance. (Statistics Austria)

1 A 4 Other Sectors:

Consideration of ‘new’ pellets, wood chips, fuel wood, natural gas and gasoil space heating technologies from 2001 onwards. This has led to lower NMVOC emissions from the combustion of biomass and lower NO_X emissions from the combustion of oil and natural gas.

FUGITIVE EMISSIONS (1 B)

Update of activity data:

1 B 2 a Oil refining: Activity data for 2002 and 2003 have been updated with data from the national energy balance. (NMVOC)

1 B 2 b *Gas Extraction / First treatment:* During QC checks a transcription error for NMVOC emissions for 2003 was found; this error has been corrected.

Improvements of methodologies and emission factors:

1 B 2 b *Gas Distribution:* The method to calculate NMVOC emissions has been changed to a country specific method similar to the Corinair detailed methodology. The relevant activity data are now the km of distribution mains. The EF is based on the mean IPCC default EF for CH_4 (0.615 Mg/km) with an average of 1.2% NMVOC in natural gas. This results in an EF of 7.38 kg NMVOC/km of distribution mains.

INDUSTRIAL PROCESSES (2)

Update of activity data:

2 D 1 Other Production - Pulp and Paper (chipboard production):

Activity data for 2003 have been updated.

2 D 2 Other Production - Food and Drink (Bread, Wine and Beer):

Activity data for 2003 have been updated.

2 D 2 Other Production - Food and Drink (Spirits):

Activity data for 1996 to 2003 have been updated.

SOLVENT USE (3)

NMVOC emissions from solvent use from 2002 onwards have been updated by means of 2001 data and sector-specific technological and economic developments. This results in a slight decrease of total NMVOC emissions from solvent use in 2003 compared to the previous submission, where emission data were constantly extrapolated from 2002 onwards.

AGRICULTURE (4)

Update of activity data:

4 D 1 Direct Soil Emissions - sewage sludge application:

Amounts of agriculturally applied sewage sludge from 2002 to 2004 have been updated with data from the National Austrian Waste Water Database.

Improvements of methodologies and emission factors:

4 A, 4 B, 4 D Enteric Fermentation, Manure Management, Agricultural Soils:

N excretion values of the Austrian livestock have been revised. Especially N excretion rates of dairy and mother cows are higher now, which results in higher NH_3 emissions from source category 4 B.

Estimates are based on the following references:

GRUBER, L. & POETSCH, E.M. (2005): Calculation of nitrogen excretion of dairy cows in Austria. Die Bodenkultur, in print.

PÖTSCH, E.M., GRUBER, L. & STEINWIDDER, A. (2005): Answers and comments on the additional questions, following the meeting in Brussels. Internal statement, HBLFA Raumberg-Gumpenstein.

STEINWIDDER, A. & GUGGENBERGER, T. (2003): Erhebungen zur Futteraufnahme und Nährstoffversorgung von Milchkühen sowie Nährstoffbilanzierung auf Grünlandbetrieben in Österreich. Die Bodenkultur 54 (1), 49-66.

UNTERARBEITSGRUPPE N-ADHOC (2004): Überprüfung und Überarbeitung der N-Anfallswerte für einzelne Tierkategorien. Unterlagen ausgearbeitet vom Fachbeirat für Bodenfruchtbarkeit und Bodenschutz des BMLFUW.

ZENTRALE ARBEITSGEMEINSCHAFT ÖSTERREICHISCHER RINDERZÜCHTER (2004): Cattle Breeding in Austria, 148pp.

4 B Manure Management:

Calculations of NH_3 emissions from housing and storage following the Corinair detailed methodology have been revised.

WASTE (6)

6 A 1 Managed Waste Disposal:

Update of activity data:

The Activity data for Residual Waste and Non-residual Waste has been updated. According to the Landfill Ordinance the operators of landfill sites have to report their activity data annually. Based on reports received after the due date, there are minor changes of the activity data in this submission compared to the previous submission.

For those years where no data on non-residual wastes were available (before 1998), extrapolation according to the GDP has been carried out instead of assuming constant data.

Double counting of the amount of construction waste has been corrected.

Improvements of methodologies and emission factors:

The methodology to calculate the amount of landfill gas has been changed and so NMVOC emissions have changed as well.

6 METHOD OF REPORTING

The emission data presented in this report were compiled according to the guidelines for estimating and reporting emission data (EB.AIR/GE.1/2002/7) approved by the Executive Body for the UNECE/ LRTAP Convention at its 20th session.

In Austria, emissions of air pollutants are included together with emissions of greenhouse gases in a database based on the CORINAIR nomenclature (CORe INventory AIR)/ SNAP (Selected Nomenclature for sources of Air Pollution). This nomenclature was designed by the EEA to estimate emissions of all kind of air pollutants. To comply with the reporting obligations under the UNECE/LRTAP Convention, emissions are transformed into the NFR (Nomenclature For Reporting) format.

The complete set of tables of the NFR Format, including in particular Sectoral Reports and Sectoral Background Tables are submitted separately in digital form only (excel files). In this report the NFR Summary Tables are presented in the Annex.

The following table summarises the status of the present report:

Table 5: Status of the present report

Reporting Obligation	Format	Inventory	Version
NEC Directive	NFR Format (UNECE)	OLI 2005	December 2005

Treatment of fuel

In the 2002 Emission Reporting Guidelines, Parties are given the choice of whether to report emissions on the basis of fuel used or fuel sold to the final consumer. It is recommended that they should clearly state the basis of their calculations in their submissions.

In the reports to the UNECE Convention on Long-range Transboundary Air Pollution and the EEA, emissions of the Austrian road transport sector are reported on the basis of fuel sold. Emissions from 'tank tourism' (see Table 6) are therefore included in the Austrian Total.

Emissions from 'tank tourism'

In the last few years, fuel prices in Austria were lower than in the neighbouring countries. One effect of this price situation has been the so-called 'tank tourism' which means that fuel is sold in Austria and used abroad. The amount of this effect was analysed in 2004 with the following study:

LEBENSMINISTERIUM (2005): Abschätzung der Auswirkungen des Tanktourismus auf den Treibstoffverbrauch und die Entwicklung der CO_2-Emissionen in Österreich. Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft, Wien 2005.

The calculation is based on extensive questionnaires (of truckers on the border, truckage companies), results of the transport model and traffic countings.

Since 2004 the emissions of 'tank tourism' have been calculated separately from the Austrian inventory.

The results for 1990 to 2004 are shown in the following table:

Table 6: NEC gas emissions from 'tank tourism' 1990-2004 [Gg]

Emission	1990	1995	2000	2001	2002	2003	2004
SO_2	-0.55	0.17	0.45	0.57	0.68	0.76	0.67
NO_X	-9.67	2.40	31.98	41.49	51.26	61.09	62.72
NMVOC	-0.25	-0.36	1.12	2.01	3.22	4.00	4.06
NH_3	0.00	-0.05	-0.04	0.05	0.21	0.29	0.30

In the early 1990s, fuel prices were lower in the neighbouring countries. Therefore the fuel was bought abroad and used in Austria.

Meanwhile prices in Austria have become notably cheaper than in the neighbouring countries. Therefore drivers buy fuel in Austria and use it abroad, which means the emissions are released abroad. Most of that fuel is used by heavy-duty vehicles for long-distance traffic (inside and outside the EU).

In 2004 about 28% of the reported NO_x emissions were caused by 'tank tourism'.

7 ANNEX

The following Annex contains tables describing trends of SO_x, NO_x, NMVOC and NH_3. The complete tables of the NFR Format, including in particular Sectoral Reports and Sectoral Background Tables, are submitted separately in digital form only (excel files).

In this report the following notation keys have been used 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.

Trend Table 1: SO_2 [Gg] 1990-2004

NFR-Sectors											
	1 ENERGY	**1 A** FUEL COMBUSTION ACTIVITIES	**1 B** FUGITIVE EMISSIONS FROM FUELS	**2** INDUSTRIAL PROCESSES	**3** SOLVENT AND OTHER PRODUCT USE	**4** AGRICULTURE	**5** LAND USE CHANGE AND FORESTRY	**6** WASTE	**7** OTHER	**NATIONAL TOTAL**	International Bunkers
1990	71,94	69,94	2,00	2,22	NA	0,00	NE	0,07	NO	74,23	0,28
1991	69,38	68,08	1,30	1,90	NA	0,00	NE	0,06	NO	71,34	0,32
1992	53,22	51,22	2,00	1,67	NA	0,00	NE	0,04	NO	54,93	0,34
1993	51,87	49,77	2,10	1,42	NA	0,00	NE	0,04	NO	53,33	0,36
1994	46,10	44,82	1,28	1,42	NA	0,00	NE	0,05	NO	47,57	0,38
1995	45,40	43,87	1,53	1,37	NA	0,00	NE	0,05	NO	46,82	0,42
1996	43,32	42,12	1,20	1,29	NA	0,00	NE	0,05	NO	44,67	0,47
1997	39,02	38,95	0,07	1,27	NA	0,00	NE	0,05	NO	40,34	0,48
1998	34,30	34,26	0,04	1,18	NA	0,00	NE	0,05	NO	35,54	0,50
1999	32,39	32,25	0,14	1,12	NA	0,00	NE	0,06	NO	33,57	0,49
2000	30,36	30,21	0,15	1,09	NA	0,00	NE	0,06	NO	31,50	0,53
2001	31,59	31,43	0,16	1,21	NA	0,00	NE	0,06	NO	32,86	0,45
2002	31,56	31,42	0,14	1,21	NA	0,00	NE	0,06	NO	32,83	0,48
2003	32,11	31,96	0,15	1,21	NA	0,00	NE	0,06	NO	33,38	0,41
2004	27,62	27,47	0,14	1,22	NA	0,00	NE	0,06	NO	28,89	0,49

Trend Table 2: NO_x [Gg] 1990-2004

NFR-Sectors											
	1 ENERGY	**1 A** FUEL COMBUSTION ACTIVITIES	**1 B** FUGITIVE EMISSIONS FROM FUELS	**2** INDUSTRIAL PROCESSES	**3** SOLVENT AND OTHER PRODUCT USE	**4** AGRICULTURE	**5** LAND USE CHANGE AND FORESTRY	**6** WASTE	**7** OTHER	**NATIONAL TOTAL**	International Bunkers
1990	200,62	200,62	IE	4,80	NA	6,08	NE	0,10	NO	211,59	2,77
1991	212,00	212,00	IE	4,48	NA	6,31	NE	0,09	NO	222,88	3,12
1992	199,42	199,42	IE	4,55	NA	5,95	NE	0,06	NO	209,98	3,40
1993	195,11	195,11	IE	1,98	NA	5,71	NE	0,05	NO	202,85	3,61
1994	186,77	186,77	IE	1,92	NA	6,12	NE	0,04	NO	194,86	3,77
1995	184,89	184,89	IE	1,46	NA	6,18	NE	0,05	NO	192,58	4,23
1996	205,13	205,13	IE	1,42	NA	5,86	NE	0,05	NO	212,46	4,66
1997	192,10	192,10	IE	1,50	NA	5,93	NE	0,05	NO	199,57	4,85
1998	204,70	204,70	IE	1,46	NA	5,93	NE	0,05	NO	212,13	5,01
1999	191,71	191,71	IE	1,44	NA	5,77	NE	0,05	NO	198,98	4,92
2000	196,69	196,69	IE	1,54	NA	5,62	NE	0,05	NO	203,90	5,36
2001	205,97	205,97	IE	1,57	NA	5,58	NE	0,05	NO	213,18	4,51
2002	212,53	212,53	IE	1,63	NA	5,52	NE	0,05	NO	219,73	4,88
2003	223,19	223,19	IE	1,34	NA	5,42	NE	0,05	NO	230,01	4,17
2004	220,37	220,37	IE	1,22	NA	5,28	NE	0,05	NO	226,91	4,90

Trend Table 3: NMVOC [Gg] 1990-2004

NFR-Sectors											
	1 ENERGY	**1 A** FUEL COMBUSTION ACTIVITIES	**1 B** FUGITIVE EMISSIONS FROM FUELS	**2** INDUSTRIAL PROCESSES	**3** SOLVENT AND OTHER PRODUCT USE	**4** AGRICULTURE	**5** LAND USE CHANGE AND FORESTRY	**6** WASTE	**7** OTHER	**NATIONAL TOTAL**	International Bunkers
1990	154,31	142,10	12,22	11,10	116,95	1,85	NE	0,16	NO	284,37	0,31
1991	156,92	143,76	13,16	12,58	100,08	1,84	NE	0,16	NO	271,58	0,35
1992	144,67	131,55	13,12	13,78	82,33	1,78	NE	0,15	NO	242,72	0,38
1993	138,85	126,00	12,86	15,05	82,43	1,75	NE	0,15	NO	238,24	0,41
1994	126,84	116,58	10,26	15,14	77,06	1,81	NE	0,14	NO	220,99	0,44
1995	121,89	113,06	8,83	15,08	81,75	1,82	NE	0,13	NO	220,66	0,48
1996	120,48	112,58	7,90	15,06	78,07	1,80	NE	0,12	NO	215,53	0,57
1997	102,60	95,23	7,37	15,32	82,93	1,88	NE	0,12	NO	202,84	0,63
1998	96,88	91,03	5,85	15,53	75,54	1,84	NE	0,11	NO	189,90	0,69
1999	91,41	86,27	5,13	15,41	69,96	1,88	NE	0,11	NO	178,76	0,67
2000	83,89	78,73	5,16	15,63	77,74	1,78	NE	0,10	NO	179,15	0,70
2001	82,05	78,74	3,31	15,41	82,63	1,86	NE	0,10	NO	182,04	0,59
2002	76,39	72,91	3,47	15,53	82,23	1,85	NE	0,10	NO	176,09	0,64
2003	76,38	72,94	3,44	15,32	81,83	1,76	NE	0,10	NO	175,38	0,54
2004	73,32	70,05	3,27	15,35	81,43	2,00	NE	0,10	NO	172,20	0,64

Trend Table 4: NH_3 [Gg] 1990-2004

NFR-Sectors											
	1 ENERGY	**1 A** FUEL COMBUSTION ACTIVITIES	**1 B** FUGITIVE EMISSIONS FROM FUELS	**2** INDUSTRIAL PROCESSES	**3** SOLVENT AND OTHER PRODUCT USE	**4** AGRICULTURE	**5** LAND USE CHANGE AND FORESTRY	**6** WASTE	**7** OTHER	**NATIONAL TOTAL**	International Bunkers
1990	2,03	2,03	IE	0,27	NA	65,98	NE	0,38	NO	68,65	0,00
1991	2,49	2,49	IE	0,51	NA	66,65	NE	0,39	NO	70,03	0,00
1992	2,67	2,67	IE	0,37	NA	64,28	NE	0,45	NO	67,76	0,00
1993	2,94	2,94	IE	0,22	NA	64,23	NE	0,54	NO	67,93	0,00
1994	3,02	3,02	IE	0,17	NA	65,11	NE	0,62	NO	68,92	0,00
1995	3,06	3,06	IE	0,10	NA	66,64	NE	0,64	NO	70,43	0,00
1996	3,07	3,07	IE	0,10	NA	64,78	NE	0,67	NO	68,62	0,00
1997	2,98	2,98	IE	0,10	NA	64,96	NE	0,65	NO	68,69	0,00
1998	3,01	3,01	IE	0,10	NA	64,92	NE	0,67	NO	68,71	0,00
1999	2,89	2,89	IE	0,12	NA	63,59	NE	0,71	NO	67,31	0,00
2000	2,69	2,69	IE	0,10	NA	62,09	NE	0,70	NO	65,58	0,00
2001	2,74	2,74	IE	0,08	NA	61,82	NE	0,70	NO	65,34	0,00
2002	2,68	2,68	IE	0,06	NA	60,73	NE	0,70	NO	64,17	0,00
2003	2,74	2,74	IE	0,08	NA	61,26	NE	0,72	NO	64,80	0,00
2004	2,56	2,56	IE	0,06	NA	60,50	NE	0,72	NO	63,84	0,00