



**Austria's Annual Air Emission
Inventory 1990–2008**

**Submission under National Emission
Ceilings Directive 2001/81/EC**

**AUSTRIA'S ANNUAL
AIR EMISSION INVENTORY
1990–2008**

Submission under
National Emission Ceilings Directive
2001/81/EC

REPORT
REP-0248

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ZUSAMMENFASSUNG

Der Bericht zeigt die neueste Entwicklung jener Luftschadstoffe, für die es nationale Emissionshöchstmengen gibt. Er folgt in Format und Inhalt den verbindlichen Anforderungen der EU-Richtlinie 2001/81/EG¹ 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 Emissionshöchstmengen für Schwefeldioxid (SO₂), Stickoxide (NO_x), flüchtige organische Verbindungen ohne Methan (NMVOC) und Ammoniak (NH₃) ab dem Jahr 2010 festgelegt.

Die NEC-Richtlinie wurde in Österreich mit dem Emissionshöchstmengengesetz-Luft² (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-Übereinkommens³ über weiträumige grenzüberschreitende Luftverunreinigung (Convention on Long-Range Transboundary Air Pollution, LRTAP) beschlossenen Inventurregeln entspricht.

Emissionstrend

Die folgende Tabelle zeigt den Trend der nationalen Gesamtemissionen ab dem Jahr 1990 bis 2008 in tausend Tonnen Gesamtmasse.

Tabelle: Österreichische Gesamtemissionen gemäß UN-Übereinkommen über weiträumige grenzüberschreitende Luftverunreinigung, 1990–2008.

	Österreichische Gesamtemissionen [Gg]			
	SO ₂	NO _x	NMVOC	NH ₃
1990	74,37	195,22	273,84	65,46
1995	47,40	181,88	223,50	70,64
2000	31,67	207,28	176,84	64,59
2001	33,05	217,86	177,43	64,46
2002	31,63	226,53	182,14	63,66
2003	32,39	237,59	181,55	63,54
2004	27,71	236,14	162,39	62,80
2005	27,54	241,64	167,81	62,63
2006	28,30	227,12	176,20	62,59
2007	24,71	220,67	164,56	63,51
2008	22,44	206,90	163,37	62,83

¹ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:309:0022:0030:DE:PDF>

² http://www.ris.bka.gv.at/Dokumente/BgblPdf/2003_34_1/2003_34_1.html

³ <http://unece.org/env/lrtap/>

Diese nationalen Gesamtemissionen wurden auf Basis der in Österreich verkauften Treibstoffe errechnet. Dabei ist zu beachten, dass in Österreich insbesondere in den letzten Jahren ein beachtlicher Teil der verkauften Treibstoffmenge im Inland getankt, jedoch im Ausland verfahren wurde (Kraftstoffexport in Fahrzeugtanks, oft auch als „Tanktourismus“ bezeichnet).

Gemäß Artikel 2 der NEC-Richtlinie gilt diese für Emissionen von Schadstoffen auf dem Gebiet der Mitgliedstaaten. Die folgende Tabelle zeigt die österreichischen Gesamtemissionen ohne Kraftstoffexport im Vergleich mit den nationalen Emissionshöchstmengen der NEC-Richtlinie. Diese Emissionsmengen sind Österreichs offizielle Inventurdaten gemäß Artikel 8 (1) der NEC-Richtlinie (vgl. Anhang 2).

Die nationalen Gesamtemissionen inklusive der Emissionen aus dem Kraftstoffexport sind in Anhang 1 angeführt.

Beide Datensätze wurden der Europäischen Kommission zusammen mit diesem Bericht im NFR⁴-Format als Excel-Dateien übermittelt.

Tabelle: Österreichische Emissionen ohne Kraftstoffexport 1990–2008 und Ziele für 2010 gemäß NEC-Richtlinie.

	Emissionen in tausend Tonnen [Gg]			
	SO₂	NO_x	NMVOG	NH₃
1990	73,66	181,73	273,11	65,46
1995	46,45	163,55	224,71	71,19
2000	31,08	164,61	176,59	65,09
2001	32,32	165,67	175,72	64,65
2002	30,83	163,59	178,34	63,32
2003	31,53	165,69	176,62	62,95
2004	27,64	164,16	157,44	62,20
2005	27,48	168,76	162,97	62,07
2006	28,25	168,29	172,19	62,11
2007	24,67	166,61	160,88	63,08
2008	22,40	162,19	160,53	62,57
	Emissionshöchstmengen in tausend Tonnen [Gg]			
2010	39,00	103,00	159,00	66,00

Für die im Inland ausgestoßenen SO₂-Emissionen wurde von 2007 auf 2008 ein weiterer Rückgang ermittelt. Die NO_x- und NMVOG-Emissionen weisen in den letzten Berichtsjahren ebenfalls rückläufige Emissionen auf. Auch bei den NH₃-Emissionen ist im Jahr 2008 – nach dem leichten Anstieg 2007 – ein Rückgang zu verzeichnen.

Die größte Abweichung zur festgesetzten nationalen Emissionshöchstmenge für 2010 ist derzeit bei den Stickoxiden zu verzeichnen, in erster Linie aufgrund der hohen Emissionen im Straßenverkehr.

⁴ Nomenclature For Reporting der UNECE

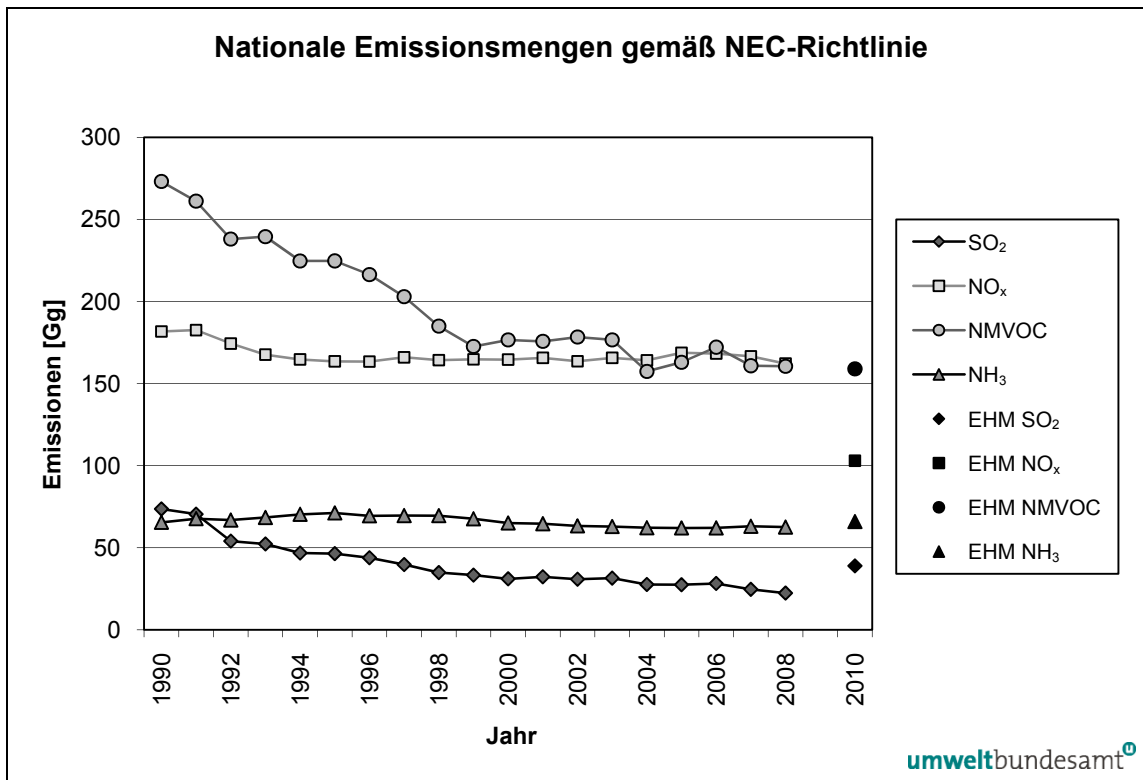


Abbildung: Österreichische Emissionen ohne Kraftstoffexport 1990–2008 und Ziele für 2010 gemäß NEC-Richtlinie.

SO₂-Emissionen

Die in der NEC-Richtlinie festgesetzte Emissionshöchstmenge für SO₂ von 39.000 Tonnen im Jahr 2010 wird in Österreich bereits seit mehreren Jahren unterschritten. Im Zeitraum 1990 bis 2008 konnten die SO₂-Emissionen (ohne Kraftstoffexport) um 69,6 % reduziert werden. Vom Jahr 2007 auf 2008 ist eine deutliche Abnahme der Emissionen um 9,2 % auf rd. 22.400 Tonnen zu verzeichnen.

NO_x-Emissionen

Im Zeitraum 1990 bis 2008 sind die NO_x-Emissionen (ohne Kraftstoffexport) um 10,8 % gesunken. Verglichen mit 2007 sind sie um 2,7 % auf rd. 162.200 Tonnen im Jahr 2008 gesunken. Damit liegen die Stickoxidemissionen immer noch beträchtlich über der in der NEC-Richtlinie festgesetzten Emissionshöchstmenge von 103.000 Tonnen im Jahr 2010.

NMVOC-Emissionen

Mit einer Emissionsmenge von rd. 160.500 Tonnen im Jahr 2008 ist bei den NMVOC-Emissionen (ohne Kraftstoffexport) seit 1990 eine Reduktion um 41,2 % zu verzeichnen. Damit übersteigen sie derzeit knapp die in der NEC-Richtlinie für das Jahr 2010 festgesetzte Emissionshöchstmenge von 159.000 Tonnen. Vom Jahr 2007 auf 2008 blieben die Emissionen in etwa konstant (– 0,2 %).

NH₃-Emissionen

Von 1990 bis 2008 konnten die NH₃-Emissionen (ohne Kraftstoffexport) um 4,4 % auf rd. 62.600 Tonnen reduziert werden. Die in der NEC-Richtlinie festgesetzte Emissionshöchstmenge für NH₃ von 66.000 Tonnen im Jahr 2010 wird bereits seit dem Jahr 2000 unterschritten. Verglichen mit 2007 sanken die NH₃-Emissionen im letzten Berichtsjahr geringfügig (– 0,8 %).

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/CORINAIR⁵ angewandt. Die Darstellung erfolgt im NFR-Format der UNECE.

In den gültigen Richtlinien zur Emissionsberichterstattung⁶ ist den einzelnen Staaten die Möglichkeit gegeben, die Emissionen vom Straßenverkehr sowohl auf Basis des verkauften Treibstoffs (fuel sold) als auch auf Basis des verbrauchten Treibstoffs (fuel consumed) zu berichten.

Kraftstoffexport

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

Im Jahr 2004 wurde vom Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft eine Studie in Auftrag gegeben, in welcher die Auswirkungen des Kraftstoffexports in Fahrzeugtanks auf den Treibstoffverbrauch und die Entwicklung der verkehrsbedingten Emissionen in Österreich abgeschätzt wurden. Eine Folgestudie aus dem Jahr 2008/2009 bestätigt das Ausmaß des Kraftstoffexportes.

Gründe für diesen Effekt sind strukturelle Gegebenheiten (Binnenland mit hohem Exportanteil in der Wirtschaft) sowie Unterschiede im Kraftstoffpreisniveau zwischen Österreich und seinen Nachbarländern.

Nachstehende Tabelle gibt Auskunft über die Emissionsmengen, die auf den Kraftstoffexport in Fahrzeugtanks zurückzuführen sind.

⁵ EMEP/EEA air pollutant emission inventory guidebook (2009): Technical report No 6/2009. Prepared by the UNECE/EMEP Task Force on Emissions Inventories and Projections (TFEIP) and published by the European Environment Agency (EEA). <http://www.eea.europa.eu/publications/emep-eea-emission-inventory-guidebook-2009>

⁶ Guidelines for Reporting Emission Data under the Convention on Long-Range Transboundary Air Pollution (LRTAP) (ECE/EB.AIR/97) http://www.ceip.at/fileadmin/inhalte/emep/reporting_2009/Rep_Guidelines_ECE_EB_AIR_97_e.pdf

Tabelle 3: Emissionen aus Kraftstoffexport in Fahrzeugtanks.

	Emissionen in tausend Tonnen [Gg]			
	SO ₂	NO _x	NMVOG	NH ₃
1990	0,71	13,50	0,73	0,00
1995	0,96	18,33	– 1,22	– 0,55
2000	0,59	42,67	0,25	– 0,50
2001	0,73	52,19	1,72	– 0,18
2002	0,79	62,93	3,80	0,34
2003	0,87	71,90	4,93	0,59
2004	0,06	71,98	4,95	0,60
2005	0,06	72,88	4,84	0,56
2006	0,05	58,83	4,01	0,48
2007	0,04	54,05	3,68	0,43
2008	0,03	44,71	2,84	0,26

Die Tabelle zeigt, dass im Jahr 2008 etwa 22 % der nationalen Gesamtemissionen an NO_x auf diesen Effekt zurückzuführen sind.

Die wichtigsten Revisionen im Vergleich zum Vorjahr

SO₂-Emissionen

Chemische Industrie (1.A.2.c)

In der nationalen Energiebilanz wurde der Einsatz der brennbaren Abfälle in der Chemischen Industrie nach unten korrigiert, was zu etwas geringeren SO₂-Emissionen im Jahr 2007 führte.

Stationäre Feuerungsanlagen im Kleinverbrauch (1.A.4.b)

In der nationalen Energiebilanz wurde ab 2001 der Kohle- und Biomasseverbrauch der Privathaushalte nach unten revidiert, was insbesondere in den letzten Jahren zu deutlich geringeren SO₂-Emissionen führte.

NO_x-Emissionen

Kalorische Kraftwerke (1.A.1.a)

In der nationalen Energiebilanz wurde der Biomasseverbrauch (insbesondere Biogas) nach oben revidiert, was zu einer Erhöhung der NO_x-Emissionen 2005–2007 führte.

Mobile Geräte in der Industrie (1.A.2.f.2)

Die Emissionsberechnung erfolgte auf Basis der aktuellen Energiestatistik der Statistik Austria. Insbesondere bei den dieselbetriebenen mobilen Maschinen und Geräten der Industrie zeigt die neue Energiestatistik eine Verdoppelung des Energieeinsatzes (und somit der Emissionen), speziell ab dem Jahr 2005.

Straßenverkehr (1.A.3.b)

Die Berechnungen ergaben für den Straßenverkehr einen geringeren Anteil am Kraftstoffexport ins Ausland, was zu höheren Emissionen im Inland führte.

Wirtschaftsdünger-Management (4.B)

In der vorliegenden Inventur wurden erstmals die NO_x-Emissionen aus Tierhaltung und Wirtschaftsdüngerlagerung berechnet.

NMVOC-Emissionen

Stationäre Feuerungsanlagen im Kleinverbrauch (1.A.4.b.1)

Die Implementierung neuer Mikrozensus-Daten zu Privathaushalten führte zu einer Verringerung des Biomasseeinsatzes bei Einzelöfen und somit zu einer Reduktion der NMVOC-Emissionen.

Lösemittel und andere Produktverwendung (3)

Die Revision ist im Wesentlichen zurückzuführen auf eine Aktualisierung

- der Außenhandelsstatistik Österreichs wie auch der Konjunkturstatistik für Handel und Dienstleistungen von Statistik Austria für die Jahre 2004–2007,
- der Nicht-Lösemittel-Anwendungen für die Jahre 2000–2007 durch Erhebungen bei Unternehmen und Fachverbänden,
- der Emissionsfaktoren durch Erhebungen bei Unternehmen und Fachverbänden sowie mittels Leistungs- und Strukturstatistik für die Jahre 2004–2007.

Die Schwankungen in der Zeitreihe der NMVOC-Emissionen sind auf die jährlich unterschiedlichen Salden der relevanten importierten und exportierten Lösungsmittel und lösungsmittelhaltigen Produktgruppen zurückzuführen.

NH₃-Emissionen

Das Berechnungsmodell für die Landwirtschaft wurde vollständig revidiert. Die detaillierte Berechnung erfolgte auf Grundlage aktualisierter Daten zu Tierhaltung, Wirtschaftsdüngermanagement und Wirtschaftsdüngerausbringung. Die verbesserte Berücksichtigung der landwirtschaftlichen Praxis in Österreich führte zu geringeren Emissionsmengen im Vergleich zur Vorjahres-Inventur.

Die Österreichische Luftschadstoff-Inventur

Das Umweltbundesamt führt jährlich eine Inventur der Emissionen 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 der vorliegenden Publikation zusammen.

Tabelle: Datengrundlage des vorliegenden Berichtes.

Inventur	Datenstand	Berichtsformat
OLI 2009	Dezember 2009	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 EU mitzuwirken. In § 6 (2) Z. 20 werden die Erstellung 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 Umweltbundesamt 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 unter Angabe der wesentlichsten methodischen Änderungen.

Anhang 1 enthält die Österreichischen Gesamtemissionen der Schadstoffe SO₂, NO_x, NH₃, und NMVOC gemäß der LRTAP-Konvention der Vereinten Nationen (UNECE). Die sektorale Gliederung der Überblickstabellen hält sich an die NFR-Nomenklatur der UNECE.

Anhang 2 zeigt die Emissionsmengen abzüglich der Emissionen durch Kraftstoffexport. Dies sind Österreichs offizielle Inventurdaten gemäß Artikel 8 (1) der NEC-Richtlinie.

Der vollständige Datensatz wird der Europäischen Kommission im NFR-Format der UNECE in digitaler Form übermittelt.

1 INTRODUCTION

This report presents a summary of Austria's Annual Air Emission Inventory 1990–2008 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/EC⁷ 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 2009 (Österreichische Luftschadstoff-Inventur, OLI 2009) prepared by the Umweltbundesamt for the years 1980 to 2008. 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)⁸. Thus they are requested to use the joint EMEP/CORINAIR Guidebook⁹ in preparing these inventories and projections.

In 2008 the Executive Body adopted the revised “Guidelines for Reporting Emission Data under the Convention on Long-Range Transboundary Air Pollution (LRTAP)” (ECE/EB.AIR/97)¹⁰ to further improve transparency, accuracy, consistency, comparability, and completeness (TACCC) 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 1990–2008 of SO₂, NO_x, NH₃ and NMVOC for the main NFR sectors as reported to the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP).

Annex 2 presents Austria's NEC emissions 1990–2008 according to Directive 2001/81/EC. Emissions are reported on the basis of fuel used (without ‘fuel export’, see chapter 6).

The complete tables of the NFR format are uploaded to the Central Data Repository (CDR)¹¹ of the EIONET in digital form (excel files).

⁷ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2001:309:0022:0030:EN:PDF>

⁸ <http://unece.org/env/lrtap/>

⁹ EMEP/EEA air pollutant emission inventory guidebook — 2009. Technical report No 6/2009. Prepared by the UNECE/EMEP Task Force on Emissions Inventories and Projections (TFEIP) and published by the European Environment Agency (EEA). <http://www.eea.europa.eu/publications/emep-eea-emission-inventory-guidebook-2009>

¹⁰ Guidelines for Reporting Emission Data under the Convention on Long-Range Transboundary Air Pollution (LRTAP) (ECE/EB.AIR/97) Österreichische Emissionen (ohne Kraftstoffexport) 1990–2008 und Ziele für 2010 gemäß NEC-Richtlinie.

¹¹ <http://cdr.eionet.europa.eu/at/ew/nec>

2 EMISSION TRENDS

According to the 2009 Guidelines for Reporting Emission Data¹⁰ Parties within the EMEP¹² region should calculate and report emissions, consistent with national energy balances reported to Eurostat or the International Energy Agency (IEA). Emissions from road vehicle transport should therefore be calculated and reported on the basis of the fuel sold. In addition, Parties may report emissions from road vehicles based on fuel used in the geographic area of the Party (see chapter 6).

Austria's total emissions 1990–2008 according to LRTAP reporting

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

Table 1: Austria's total emissions 1990–2008 according to LRTAP reporting.

	National Total Emissions [Gg]			
	SO ₂	NO _x	NMVOG	NH ₃
1990	74.37	195.22	273.84	65.46
1995	47.40	181.88	223.50	70.64
2000	31.67	207.28	176.84	64.59
2001	33.05	217.86	177.43	64.46
2002	31.63	226.53	182.14	63.66
2003	32.39	237.59	181.55	63.54
2004	27.71	236.14	162.39	62.80
2005	27.54	241.64	167.81	62.63
2006	28.30	227.12	176.20	62.59
2007	24.71	220.67	164.56	63.51
2008	22.44	206.90	163.37	62.83

As can be seen in Table 1 the major reductions from 1990 to 2008 were achieved in SO₂ and NMVOC emissions (–69.8% and –40.3%). In 2008 total emissions of NH₃ were 4.0% below the level of 1990, NO_x emissions were 6.0% above the level of 1990 (see Figure 1).

¹² EMEP - Co-operative programme for monitoring and evaluation of long range transmission of air pollutants in Europe
<http://www.emep.int/>

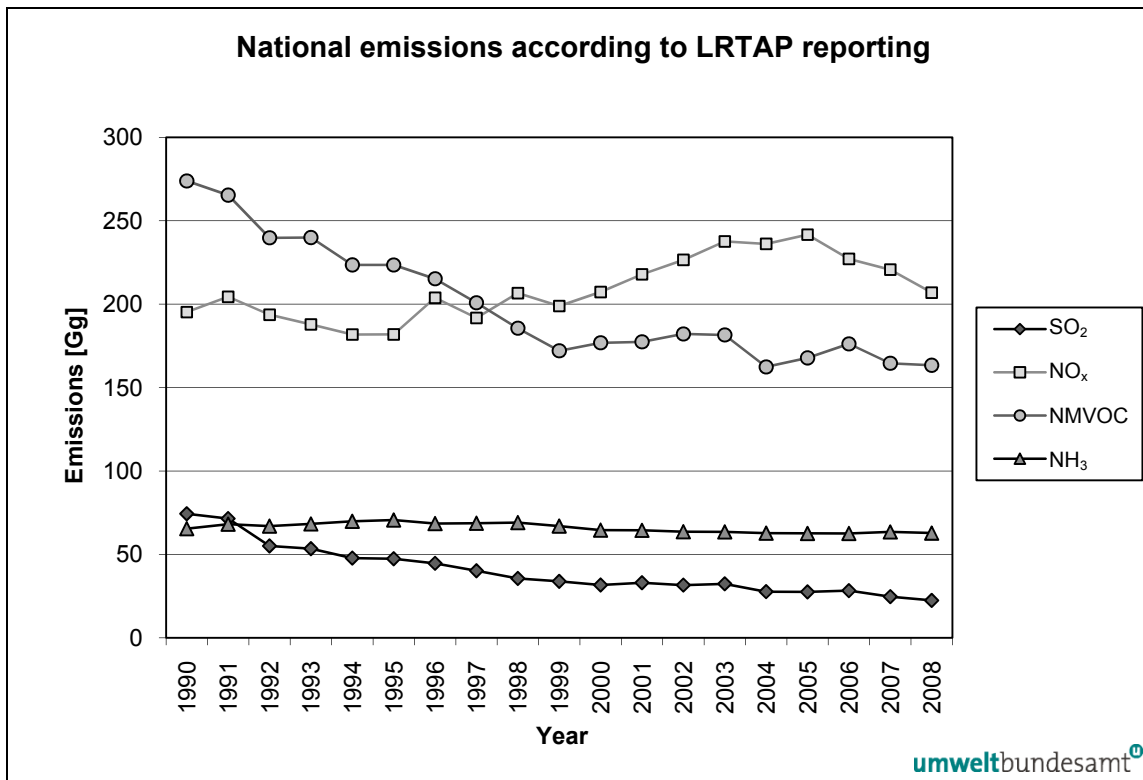


Figure 1: Trends of SO₂, NO_x, NMVOC and NH₃ emissions according to LRTAP reporting.

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

Austria's emissions 1990–2008 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 'fuel export'). Austria has experienced a considerable amount of 'fuel export' 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 'fuel export' according to Table 2 as Austria's official inventory under Article 8 (1) of the Directive. Details regarding 'fuel export' are presented in Chapter 6.

Table 2: Austria's emissions 1990–2008 according to Directive 2001/81/EC and ceilings for 2010.

Emissions without 'fuel export' [Gg]				
	SO ₂	NO _x	NMVOC	NH ₃
1990	73.66	181.73	273.11	65.46
1995	46.45	163.55	224.71	71.19
2000	31.08	164.61	176.59	65.09
2001	32.32	165.67	175.72	64.65
2002	30.83	163.59	178.34	63.32
2003	31.53	165.69	176.62	62.95
2004	27.64	164.16	157.44	62.20
2005	27.48	168.76	162.97	62.07
2006	28.25	168.29	172.19	62.11
2007	24.67	166.61	160.88	63.08
2008	22.40	162.19	160.53	62.57
Ceilings 2010 [Gg]				
2010	39.00	103.00	159.00	66.00

Figure 2 shows the trends of Austria's NEC emissions according to Directive 2001/81/EC with-out 'fuel export':

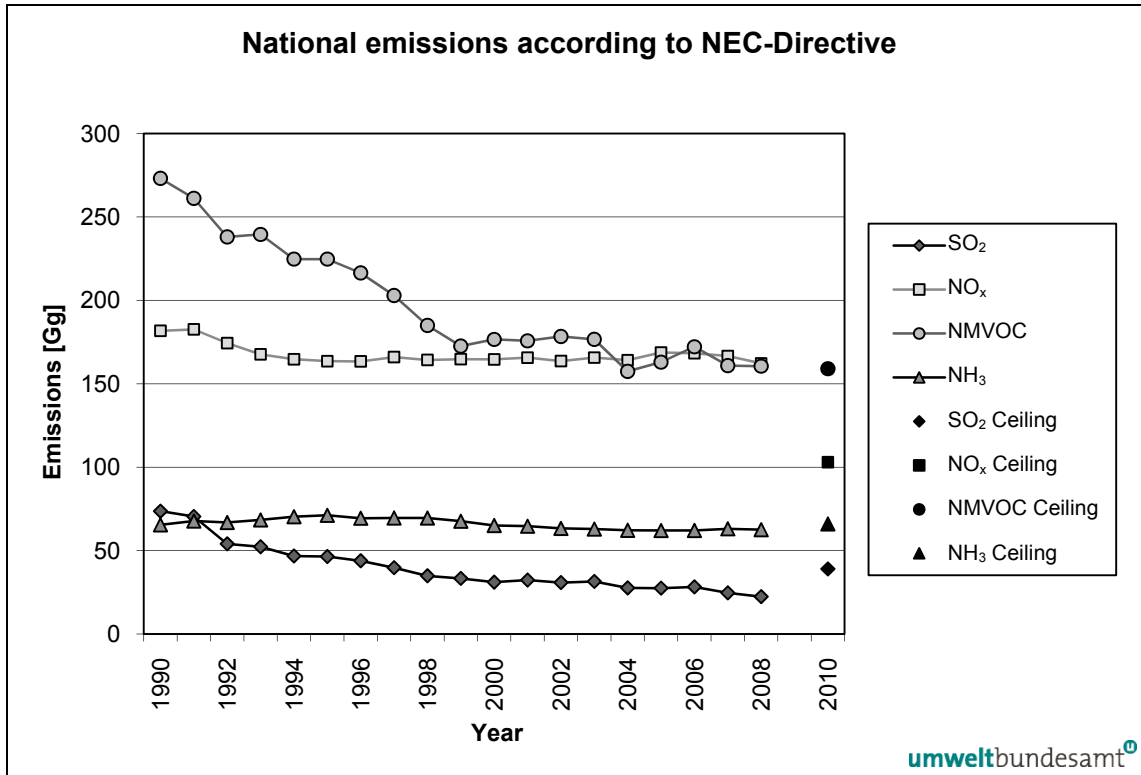


Figure 2: SO₂, NO_x, NMVOC and NH₃ emissions without 'fuel export' and NEC emission ceilings.

SO₂ Emissions

In 1990 SO₂ emissions without 'fuel export' amounted to 73.7 Gg; emissions have decreased steadily since then and by 2008 emissions were reduced by 69.6%.

The 2010 national emission ceiling for SO₂ emissions in Austria as set out in the NEC Directive is 39 Gg. In the last twelve years, Austria's SO₂ emissions without 'fuel export' were already below this ceiling; in 2008 they amounted to 22.4 Gg.

NO_x Emissions

In 1990 NO_x emissions without 'fuel export' amounted to 181.7 Gg; in 2008 emissions were 10.8% below 1990 levels.

The 2010 national emission ceiling for NO_x emissions in Austria as set out in the NEC Directive is 103 Gg. With 162.2 Gg in 2008, NO_x emissions without 'fuel export' in Austria are at the moment well above this ceiling.

NM VOC Emissions

In 1990 NMVOC emissions without 'fuel export' amounted to 273.1 Gg; by 2008 emissions were reduced by 41.2%.

The national emission ceiling 2010 for NMVOC emissions in Austria as set out in the NEC Directive is 159 Gg. With 160.5 Gg NMVOC in 2008, Austria's emissions without 'fuel export' are at the moment just above this ceiling.

NH₃ Emissions

In 1990 NH₃ emissions without 'fuel export' amounted to 65.5 Gg; in 2008 emissions were 4.4% below 1990 levels.

The 2010 national emission ceiling for NH₃ emissions in Austria as set out in the NEC Directive is 66 Gg. In the last nine years, Austria's NH₃ emissions without 'fuel export' were already below this ceiling; in 2008 they amounted to 62.6 Gg.

3 RELATION TO DATA REPORTED EARLIER

As a result of the continuous improvement of Austria's Annual Air Emission Inventory, emissions of some sources have been recalculated, based on updated data or revised methodologies. Thus emission data for 1990 to 2007 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 compared to the previous submission.

	Recalculation Difference [%]			
	LRTAP		NEC	
	1990	2007	1990	2007
SO ₂	±0%	-3%	±0%	-3%
NO _x	+1%	±0%	+1%	+2%
NM VOC	±0%	-5%	±0%	-9%
NH ₃	-8%	-4%	-8%	-4%

SO₂ Emissions

1.A.2.c *Chemicals*: consumption of industrial waste has been revised leading to lower SO₂ emissions in 2007.

1.A.4.b Residential: residential heating coal consumption has been shifted to 1.A.2 manufacturing industries, thus giving lower SO₂ emissions for the years 2005–2007.

NO_x Emissions

1.A.1.a *Public Electricity and Heat Production*: biomass (biogas) consumption has been adjusted upwards for the years 2005 – 2007 which leads to higher NO_x emissions.

1.A.2.f.2 *Combustion in Manufacturing Industries and Construction*: Other mobile machinery fuel consumption has been adjusted upwards for the years 2005 – 2007 which leads to higher NO_x emissions (2 kt in 2007).

1.A.3.b *Road Transportation*: The calculations resulted in smaller amount of 'fuel export' and thus higher emissions on the Austrian territory.

4.B *Manure Management*: for the first time NO_x emissions from manure management have been estimated.

NM VOC Emissions

1.A.4.b.1 *Residential – stationary*: a new household census has been applied from 2004 onwards. This leads to a shift of biomass consumption from stoves to boilers and thus to a reduction of NM VOC emissions.

3 *Solvent and Other Product Use*: Updated statistical data and an update of activity data and emission factors within surveys of plant specific data led to lower NM VOC emissions for 2007 compared to the previous submission.

NH₃ Emissions

4 Agriculture: For the inventory 2009 the NH₃ emission model was revised implementing new representative data on animal husbandry and manure management systems all over Austria. The revision led to lower NH₃ emissions from sector Agriculture (-3,3 kt in 2007).

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

4 SOURCES OF DATA

The following table 4 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
Transport	Energy Balance from Statistik Austria	Umweltbundesamt (Aviation), Technical University Graz (Road and Off-road)
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: Forschungsinstitut für Energie und Umweltplanung, Wirtschaft und Marktanalysen GmbH and Institut für industrielle Ökologie
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	Umweltbundesamt
Waste	Database on landfills (1998–2007), Electronic Data Management (from 2008 on)	Umweltbundesamt

The main sources for emission factors are:

- National studies for country-specific emission factors;
- Plant-specific data reported by plant operators;
- EMEP/CORINAIR Guidebook — 2009⁹.

A detailed description on the activity data, emission factors and methodologies applied will be provided in Austria's Informative Inventory Report (IIR) 2010.

5 RECALCULATIONS

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

REPORTING

The revised NFR templates (NFR09)¹³ from the revised Guidelines for Reporting Emission Data have been used. The NFR09 is more detailed and does not define the subtotals of the old NFR (e.g. category *1.A.2 Manufacturing Industries and Construction*). NFR activity data is now better linked with sector emissions and more detailed (especially for energy).

ENERGY (1.A)

Update of activity data:

1.A.1.a Public Electricity and Heat Production:

The biomass (biogas) consumption has been adjusted upwards for the years 2005–2007, which leads to higher NO_x emissions.

1.A.2.c Chemicals:

Consumption of industrial waste has been revised leading to lower emissions in 2007.

1.A.4.b Residential:

The coal consumption (in residential heatings) has been shifted to 1.A.2 manufacturing industries, thus giving lower SO₂ emissions for the years 2005–2007.

A new household census has been applied from 2004 onwards. This leads to a shift of biomass consumption from stoves to boilers and thus to a reduction of NMVOC emissions.

1.A.2.f Manufacturing Industries and Construction – Other – mobile sources:

The mobile machinery fuel consumption has been adjusted upwards for the years 2005–2007, which leads to higher NO_x emissions (2 kt in 2007).

1.A.3.b Road Transportation:

An update of statistical energy data, particularly energy consumption for mobile machines in 1.A.2.f c shows that more fuel is used by off-road vehicles. As the overall fuel consumption is a fixed value, this increase in fuel consumption had to be counterbalanced by a decrease of fuel export on the road.

1.A.3.c Railways:

Activity data was updated with updated emission factors.

¹³ Annex IV of the revised Guidelines for Reporting Emission Data: Reporting templates - last update 15 October 2009

<http://www.ceip.at/reporting-instructions/list-of-annexes-2010/>

1.A.4 Other Sectors – mobile:

Activity data for mobile machineries for the whole time series was updated following the revised national energy balance.

Improvements of methodologies and emission factors:

1.A.3.b Road Transport:

Adaptation of the specific CO₂ emissions factors of passenger cars according to the national CO₂ monitoring data

1.A.3.c Railways:

Activity data was updated with updated emission factors.

FUGITIVE EMISSIONS (1 B)

Update of activity data:

1.B.2.b Natural gas: NMVOC emissions from natural gas distribution have been recalculated for the whole time-series taking into account the material specific composition of the distribution network.

INDUSTRIAL PROCESSES (2)

Update of activity data:

2.D.2 Other Production – Food and Drink (Bread, Wine, Beer and Spirits):

Activity data for 2007 has been updated.

SOLVENT USE (3)

Update of activity data:

3.A, 3.B, 3.C and 3.D.5.:

The short term statistics for trade and services and the Austrian foreign trade statistics was updated from 2004 onwards.

The activity data from 2000 onwards concerning non-solvent use and the solvent content of products has been updated by surveys at companies and associations.

Improvements of methodologies and emission factors:

3.A, 3.B, 3.C and 3.D.5.:

Emission factors have been updated with information from surveys at companies and associations from 2004 onwards.

AGRICULTURE (4)

Improvements of methodologies and emission factors:

Sector 4 – Ammonia:

For the inventory 2009 the NH₃ emission model was revised on the basis of a new study commissioned by the Umweltbundesamt (AMON, B. & HÖRTENHUBER, S. 2008)¹⁴.

In the new model representative data on animal husbandry and manure management systems all over Austria were implemented. The new data is based on the research project “Animal husbandry and manure management systems in Austria” (AMON et al. 2007)¹⁵. This comprehensive survey was headed by the Division of Agricultural Engineering (DAE) of the Department for Sustainable Agricultural Systems at the University of Natural Resources and Applied Life Sciences in close co-operation with the Swiss College of Agriculture, the Austrian Chamber of Agriculture, the Umweltbundesamt, the Federal Research Centre for Agriculture in Alpine Regions, and Statistics Austria.

Through the integration of new manure management options new emission factors had to be found. Where no national emission factors were available, emission factors were taken from the Swiss ammonia inventory which is calculated with the computer based programme “DYNAMO” (MENZI et al. 2003¹⁶, REIDY et al. 2007¹⁷, REIDY & MENZI 2005¹⁸). Due to similar management strategies and geographic structures, Swiss animal husbandry is closest to Austrian animal husbandry. The inventory revision led to a considerable improvement of the inventory quality.

Sector 4 – Nitric Oxide:

For the first time NO_x emissions from manure management have been estimated using the default emission factors of the new EMEP/CORINAIR emission inventory guidebook 2008.

¹⁴ AMON, B. & HÖRTENHUBER, S. (2008): Revision der österreichischen Luftschadstoff-Inventur (OLI) für NH₃, NMVOC und NO_x; Sektor Landwirtschaft. Universität für Bodenkultur, Institut für Landtechnik im Auftrag vom Umweltbundesamt. Wien.

¹⁵ AMON, B., FRÖHLICH, M., WEIßENSTEINER, R., ZABLATNIK, B., AMON, T. (2007): Tierhaltung und Wirtschaftsdüngermanagement in Österreich Endbericht Projekt Nr 1441 Auftraggeber: Bundesministerium für Land und Forstwirtschaft, Umwelt- und Wasserwirtschaft. Wien.

¹⁶ MENZI, H.; RUETTIMANN, L.; REIDY, B. (2003): DYNAMO: A new calculation model for dynamic emission inventories for ammonia Proc Internat Symposium "Gaseous and odour emissions from animal production facilities", Horsens, Denmark, June 1-4 2.

¹⁷ REIDY, B.; RIHM, B.; MENZI, H. (2007): A new Swiss inventory of ammonia emissions from agriculture based on a survey on farm and manure management and farm-specific model calculations, Reference: AEA7495, IN Journal: Atmospheric Environment.

¹⁸ REIDY, B. & MENZI, H. (2005): Ammoniakemissionen in der Schweiz: Neues Emissionsinventar 1990 bis 2000 mit Hochrechnungen bis 2003 Technischer Schlussbericht Schweizerische Hochschule für Zollikofen.

WASTE (6)

Update of activity data

6.A.1 Managed waste disposal on land: Activity data has changed over the whole time series, mainly due to the slightly adapted compilation of the waste types considered. Another reason for the revised activity data is the delay in reports made by operators of landfill sites on deposited waste amounts – mainly with regard to residual waste, sorting residues, sludges and paper landfilled in 2007. Furthermore, the DOC for sludge disposal and bio-waste was adjusted slightly (from 0.77 to 0.55) in this year's submission.

6.D Compost Production: Activity data for organic waste composted have been updated for the years 2004–2007 as new data and findings became available, resulting in significantly higher emission values for the past years.

6 METHOD OF REPORTING

The emission data presented in this report were compiled according to the Guidelines for Reporting Emission Data (ECE/EB.AIR/97)¹⁰ approved by the Executive Body for the UNECE/LRTAP Convention at its 26th 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 kinds 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, is submitted separately in digital form only (excel files). In this report the NFR Summary Tables are presented in the Annexes 1 and 2.

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 2009	December 2009

Treatment of fuel

According to the 2009 Revised Guidelines for Reporting Emission Data, Parties within the EMEP region should calculate and report emissions, consistent with national energy balances reported to Eurostat or the International Energy Agency (IEA). Emissions from road vehicle transport should therefore be calculated and reported on the basis of the fuel sold. In addition, Parties may report emissions from road vehicles based on fuel used in the geographic area of the Party.

In the reports to the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP) and to the EEA, emissions of the Austrian road transport sector are reported on the basis of fuel sold. Emissions from 'fuel export' (see Table 6) are therefore included in the Austrian Total (see Annex 1).

Emissions from 'fuel export'

In the year 2004 a study was commissioned analysing the effect of fuel price differences between Austria and the neighbouring countries. One effect is the so-called 'fuel export' which means that fuel is sold in Austria and used abroad. The calculation is based on extensive questionnaires (of truckers on the border, truckage companies), results of the transport model and traffic countings. The size of this effect was confirmed by a 2008 update of this study (unpublished).

Since 2004 the emissions of 'fuel export' have been calculated separately from the Austrian inventory.

The results for 1990 to 2008 are shown in the following table 6:

Table 6: *NEC emissions from 'fuel export' 1990–2008 [Gg].*

	Emission [Gg]			
	SO ₂	NO _x	NMVOG	NH ₃
1990	0.71	13.50	0.73	0.00
1995	0.96	18.33	-1.22	-0.55
2000	0.59	42.67	0.25	-0.50
2001	0.73	52.19	1.72	-0.18
2002	0.79	62.93	3.80	0.34
2003	0.87	71.90	4.93	0.59
2004	0.06	71.98	4.95	0.60
2005	0.06	72.88	4.84	0.56
2006	0.05	58.83	4.01	0.48
2007	0.04	54.05	3.68	0.43
2008	0.03	44.71	2.84	0.26

In the early 1990s, fuel prices were lower in the neighbouring countries. Negative values refer to gasoline bought abroad and used in Austria. Diesel used by heavy-duty vehicles for long-distance traffic (inside and outside the EU) is often refilled at private companies with better conditions (cheaper prices) than public petrol stations.

In 2008 about 22% of the reported NO_x emissions were caused by 'fuel export'.

Austria's official inventory data under Article 8 (1) of the NEC Directive are reported on the basis of fuel used. Thus, emissions from 'fuel export' (see Table 6) are not included in the Austrian Total according to the NEC Directive. Data are listed in Annex 2 of this report.

ANNEX 1: EMISSIONS ACCORDING TO LRTAP REPORTING

The following Annex contains tables describing trends of SO₂, NO_x, NMVOC and NH₃ as reported to the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP). Calculations are based on fuel sold.

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.

Table A.I-1: SO₂ [Gg] 1990–2008.

	NFR-Sectors according to LRTAP reporting										International Bunkers
	1	1 A	1 B	2	3	4	5	6	7	NATIONAL TOTAL	
	ENERGY	FUEL COMBUSTION ACTIVITIES	FUGITIVE EMISSIONS FROM FUELS	INDUSTRIAL PROCESSES	SOLVENT AND OTHER PRODUCT USE	AGRICULTURE	LAND USE CHANGE AND FORESTRY	WASTE	OTHER		
1990	72.07	70.07	2.00	2.22	NA	0.00	NE	0.07	NO	74.37	0.26
1991	69.51	68.21	1.30	1.90	NA	0.00	NE	0.06	NO	71.47	0.29
1992	53.37	51.37	2.00	1.67	NA	0.00	NE	0.04	NO	55.08	0.31
1993	51.98	49.88	2.10	1.42	NA	0.00	NE	0.04	NO	53.44	0.33
1994	46.35	45.07	1.28	1.42	NA	0.00	NE	0.05	NO	47.82	0.34
1995	45.98	44.45	1.53	1.37	NA	0.00	NE	0.05	NO	47.40	0.38
1996	43.32	42.12	1.20	1.29	NA	0.00	NE	0.05	NO	44.66	0.43
1997	38.88	38.82	0.07	1.27	NA	0.00	NE	0.05	NO	40.20	0.44
1998	34.37	34.32	0.04	1.18	NA	0.00	NE	0.05	NO	35.60	0.46
1999	32.68	32.54	0.14	1.12	NA	0.00	NE	0.06	NO	33.86	0.45
2000	30.52	30.38	0.15	1.09	NA	0.00	NE	0.06	NO	31.67	0.48
2001	31.78	31.62	0.16	1.21	NA	0.00	NE	0.06	NO	33.05	0.47
2002	30.36	30.22	0.14	1.21	NA	0.00	NE	0.06	NO	31.63	0.43
2003	31.12	30.97	0.15	1.21	NA	0.00	NE	0.06	NO	32.39	0.40
2004	26.43	26.29	0.14	1.22	NA	0.00	NE	0.06	NO	27.71	0.47
2005	26.26	26.13	0.13	1.22	NA	0.00	NE	0.06	NO	27.54	0.55
2006	27.02	26.85	0.17	1.22	NA	0.00	NE	0.06	NO	28.30	0.58
2007	23.43	23.25	0.18	1.22	NA	0.00	NE	0.06	NO	24.71	0.61
2008	21.15	20.99	0.16	1.23	NA	0.00	NE	0.06	NO	22.44	0.61

Table A.I-2: NO_x [Gg] 1990–2008.

	NFR-Sectors according to LRTAP reporting										International Bunkers
	1	1 A	1 B	2	3	4	5	6	7	NATIONAL TOTAL	
	ENERGY	FUEL COMBUSTION ACTIVITIES	FUGITIVE EMISSIONS FROM FUELS	INDUSTRIAL PROCESSES	SOLVENT AND OTHER PRODUCT USE	AGRICULTURE	LAND USE CHANGE AND FORESTRY	WASTE	OTHER		
1990	183.48	183.48	IE	4.80	NA	6.85	NE	0.10	NO	195.22	2.44
1991	192.79	192.79	IE	4.48	NA	7.04	NE	0.09	NO	204.40	2.76
1992	182.37	182.37	IE	4.55	NA	6.67	NE	0.06	NO	193.65	3.00
1993	179.34	179.34	IE	1.98	NA	6.47	NE	0.05	NO	187.85	3.18
1994	172.96	172.96	IE	1.92	NA	6.87	NE	0.04	NO	181.80	3.31
1995	173.39	173.39	IE	1.46	NA	6.99	NE	0.05	NO	181.88	3.73
1996	195.71	195.71	IE	1.42	NA	6.66	NE	0.05	NO	203.84	4.14
1997	183.55	183.55	IE	1.50	NA	6.66	NE	0.05	NO	191.75	4.29
1998	198.42	198.42	IE	1.46	NA	6.68	NE	0.05	NO	206.60	4.43
1999	190.90	190.90	IE	1.44	NA	6.47	NE	0.05	NO	198.87	4.33
2000	199.33	199.33	IE	1.54	NA	6.35	NE	0.05	NO	207.28	6.44
2001	209.90	209.90	IE	1.57	NA	6.34	NE	0.05	NO	217.86	6.32
2002	218.60	218.60	IE	1.63	NA	6.25	NE	0.05	NO	226.53	5.67
2003	230.09	230.09	IE	1.34	NA	6.11	NE	0.05	NO	237.59	5.21
2004	228.85	228.85	IE	1.28	NA	5.96	NE	0.05	NO	236.14	6.09
2005	233.92	233.92	IE	1.75	NA	5.92	NE	0.05	NO	241.64	6.99
2006	219.32	219.32	IE	1.82	NA	5.93	NE	0.05	NO	227.12	7.54
2007	212.89	212.89	IE	1.71	NA	6.01	NE	0.05	NO	220.67	7.99
2008	199.16	199.16	IE	1.59	NA	6.09	NE	0.05	NO	206.90	7.90

Table A.I-3: NMVOC [Gg] 1990–2008.

	NFR-Sectors according to LRTAP reporting									NATIONAL TOTAL	International Bunkers
	1	1 A	1 B	2	3	4	5	6	7		
	ENERGY	FUEL COMBUSTION ACTIVITIES	FUGITIVE EMISSIONS FROM FUELS	INDUSTRIAL PROCESSES	SOLVENT AND OTHER PRODUCT USE	AGRICULTURE	LAND USE CHANGE AND FORESTRY	WASTE	OTHER		
1990	146.30	134.17	12.13	11.10	114.43	1.85	NE	0.16	NO	273.84	0.18
1991	153.83	140.76	13.07	12.58	96.93	1.85	NE	0.16	NO	265.34	0.20
1992	145.52	132.50	13.02	13.78	78.54	1.79	NE	0.15	NO	239.78	0.22
1993	143.04	130.30	12.74	15.05	79.91	1.76	NE	0.14	NO	239.91	0.24
1994	132.99	122.86	10.13	13.57	75.02	1.81	NE	0.14	NO	223.52	0.25
1995	128.33	119.64	8.68	11.95	81.27	1.82	NE	0.13	NO	223.50	0.29
1996	125.46	117.70	7.75	10.37	77.47	1.80	NE	0.12	NO	215.22	0.34
1997	106.29	99.08	7.21	9.06	83.48	1.88	NE	0.11	NO	200.84	0.37
1998	100.45	94.76	5.68	7.71	75.46	1.84	NE	0.11	NO	185.57	0.40
1999	94.63	89.68	4.95	6.04	69.41	1.88	NE	0.11	NO	172.06	0.39
2000	87.65	82.68	4.97	4.96	82.35	1.79	NE	0.10	NO	176.84	0.42
2001	84.20	81.08	3.12	4.38	86.90	1.86	NE	0.10	NO	177.43	0.41
2002	79.84	76.58	3.26	4.57	95.77	1.86	NE	0.10	NO	182.14	0.37
2003	77.78	74.55	3.22	4.26	97.69	1.73	NE	0.10	NO	181.55	0.34
2004	72.35	69.31	3.04	4.40	83.58	1.98	NE	0.09	NO	162.39	0.40
2005	72.76	69.90	2.86	4.71	88.39	1.86	NE	0.09	NO	167.81	0.47
2006	65.73	62.85	2.88	4.87	103.73	1.79	NE	0.08	NO	176.20	0.50
2007	62.74	60.25	2.49	4.89	95.06	1.79	NE	0.08	NO	164.56	0.53
2008	59.50	57.25	2.25	4.74	97.11	1.95	NE	0.07	NO	163.37	0.52

Table A.I-4: NH₃ [Gg] 1990–2008.

	NFR-Sectors according to LRTAP reporting									NATIONAL TOTAL	International Bunkers
	1	1 A	1 B	2	3	4	5	6	7		
	ENERGY	FUEL COMBUSTION ACTIVITIES	FUGITIVE EMISSIONS FROM FUELS	INDUSTRIAL PROCESSES	SOLVENT AND OTHER PRODUCT USE	AGRICULTURE	LAND USE CHANGE AND FORESTRY	WASTE	OTHER		
1990	4.03	4.03	IE	0.27	NA	60.80	NE	0.36	NO	65.46	0.00
1991	5.68	5.68	IE	0.51	NA	61.59	NE	0.37	NO	68.15	0.00
1992	6.50	6.50	IE	0.37	NA	59.69	NE	0.42	NO	66.99	0.00
1993	7.34	7.34	IE	0.22	NA	60.23	NE	0.50	NO	68.29	0.00
1994	7.99	7.99	IE	0.17	NA	61.16	NE	0.57	NO	69.88	0.00
1995	7.82	7.82	IE	0.10	NA	62.14	NE	0.58	NO	70.64	0.00
1996	7.34	7.34	IE	0.10	NA	60.51	NE	0.60	NO	68.55	0.00
1997	6.83	6.83	IE	0.10	NA	61.16	NE	0.59	NO	68.68	0.00
1998	6.88	6.88	IE	0.10	NA	61.53	NE	0.60	NO	69.12	0.00
1999	6.21	6.21	IE	0.12	NA	60.06	NE	0.64	NO	67.02	0.00
2000	5.68	5.68	IE	0.10	NA	58.15	NE	0.66	NO	64.59	0.00
2001	5.52	5.52	IE	0.08	NA	58.13	NE	0.74	NO	64.46	0.00
2002	5.41	5.41	IE	0.06	NA	57.37	NE	0.81	NO	63.66	0.00
2003	5.20	5.20	IE	0.08	NA	57.38	NE	0.88	NO	63.54	0.00
2004	4.71	4.71	IE	0.06	NA	56.87	NE	1.17	NO	62.80	0.00
2005	4.41	4.41	IE	0.07	NA	56.87	NE	1.29	NO	62.63	0.00
2006	3.93	3.93	IE	0.07	NA	57.23	NE	1.35	NO	62.59	0.00
2007	3.63	3.63	IE	0.08	NA	58.40	NE	1.40	NO	63.51	0.00
2008	3.28	3.28	IE	0.08	NA	58.05	NE	1.41	NO	62.83	0.00

ANNEX 2: EMISSIONS ACCORDING TO NEC DIRECTIVE

In the following tables Austria's emissions 1990–2008 according to Directive 2001/81/EC are listed. NEC emissions are reported on the basis of fuel used (without 'fuel export').

The complete tables of the NFR Format are submitted separately in digital form only (excel files).

Table A.II-1: SO₂ [Gg] 1990–2008.

	NFR-Sectors according to NEC directive									NATIONAL TOTAL	International Bunkers
	1	1 A	1 B	2	3	4	5	6	7		
	ENERGY	FUEL COMBUSTION ACTIVITIES	FUGITIVE EMISSIONS FROM FUELS	INDUSTRIAL PROCESSES	SOLVENT AND OTHER PRODUCT USE	AGRICULTURE	LAND USE CHANGE AND FORESTRY	WASTE	OTHER		
1990	71.37	69.37	2.00	2.22	NA	0.00	NE	0.07	NO	73.66	0.26
1991	68.51	67.21	1.30	1.90	NA	0.00	NE	0.06	NO	70.47	0.29
1992	52.37	50.37	2.00	1.67	NA	0.00	NE	0.04	NO	54.07	0.31
1993	50.85	48.75	2.10	1.42	NA	0.00	NE	0.04	NO	52.32	0.33
1994	45.32	44.04	1.28	1.42	NA	0.00	NE	0.05	NO	46.79	0.34
1995	45.03	43.50	1.53	1.37	NA	0.00	NE	0.05	NO	46.45	0.38
1996	42.57	41.37	1.20	1.29	NA	0.00	NE	0.05	NO	43.92	0.43
1997	38.44	38.38	0.07	1.27	NA	0.00	NE	0.05	NO	39.77	0.44
1998	33.66	33.62	0.04	1.18	NA	0.00	NE	0.05	NO	34.90	0.46
1999	32.17	32.02	0.14	1.12	NA	0.00	NE	0.06	NO	33.34	0.45
2000	29.93	29.79	0.15	1.09	NA	0.00	NE	0.06	NO	31.08	0.48
2001	31.05	30.89	0.16	1.21	NA	0.00	NE	0.06	NO	32.32	0.47
2002	29.56	29.42	0.14	1.21	NA	0.00	NE	0.06	NO	30.83	0.43
2003	30.26	30.11	0.15	1.21	NA	0.00	NE	0.06	NO	31.53	0.40
2004	26.37	26.22	0.14	1.22	NA	0.00	NE	0.06	NO	27.64	0.47
2005	26.20	26.07	0.13	1.22	NA	0.00	NE	0.06	NO	27.48	0.55
2006	26.97	26.81	0.17	1.22	NA	0.00	NE	0.06	NO	28.25	0.58
2007	23.39	23.21	0.18	1.22	NA	0.00	NE	0.06	NO	24.67	0.61
2008	21.12	20.96	0.16	1.23	NA	0.00	NE	0.06	NO	22.40	0.61

Table A.II-2: NO_x [Gg] 1990–2008.

	NFR-Sectors according to NEC directive									NATIONAL TOTAL	International Bunkers
	1	1 A	1 B	2	3	4	5	6	7		
	ENERGY	FUEL COMBUSTION ACTIVITIES	FUGITIVE EMISSIONS FROM FUELS	INDUSTRIAL PROCESSES	SOLVENT AND OTHER PRODUCT USE	AGRICULTURE	LAND USE CHANGE AND FORESTRY	WASTE	OTHER		
1990	169.98	169.98	IE	4.80	NA	6.85	NE	0.10	NO	181.73	2.44
1991	170.97	170.97	IE	4.48	NA	7.04	NE	0.09	NO	182.58	2.76
1992	163.10	163.10	IE	4.55	NA	6.67	NE	0.06	NO	174.38	3.00
1993	159.13	159.13	IE	1.98	NA	6.47	NE	0.05	NO	167.64	3.18
1994	155.87	155.87	IE	1.92	NA	6.87	NE	0.04	NO	164.71	3.31
1995	155.06	155.06	IE	1.46	NA	6.99	NE	0.05	NO	163.55	3.73
1996	155.29	155.29	IE	1.42	NA	6.66	NE	0.05	NO	163.42	4.14
1997	157.81	157.81	IE	1.50	NA	6.66	NE	0.05	NO	166.01	4.29
1998	156.11	156.11	IE	1.46	NA	6.68	NE	0.05	NO	164.29	4.43
1999	156.79	156.79	IE	1.44	NA	6.47	NE	0.05	NO	164.76	4.33
2000	156.66	156.66	IE	1.54	NA	6.35	NE	0.05	NO	164.61	6.44
2001	157.71	157.71	IE	1.57	NA	6.34	NE	0.05	NO	165.67	6.32
2002	155.66	155.66	IE	1.63	NA	6.25	NE	0.05	NO	163.59	5.67
2003	158.19	158.19	IE	1.34	NA	6.11	NE	0.05	NO	165.69	5.21
2004	156.87	156.87	IE	1.28	NA	5.96	NE	0.05	NO	164.16	6.09
2005	161.04	161.04	IE	1.75	NA	5.92	NE	0.05	NO	168.76	6.99
2006	160.50	160.50	IE	1.82	NA	5.93	NE	0.05	NO	168.29	7.54
2007	158.84	158.84	IE	1.71	NA	6.01	NE	0.05	NO	166.61	7.99
2008	154.45	154.45	IE	1.59	NA	6.09	NE	0.05	NO	162.19	7.90

Table A.II-3: NMVOC [Gg] 1990–2008.

	NFR-Sectors according to NEC directive									NATIONAL TOTAL	International Bunkers
	1	1 A	1 B	2	3	4	5	6	7		
	ENERGY	FUEL COMBUSTION ACTIVITIES	FUGITIVE EMISSIONS FROM FUELS	INDUSTRIAL PROCESSES	SOLVENT AND OTHER PRODUCT USE	AGRICULTURE	LAND USE CHANGE AND FORESTRY	WASTE	OTHER		
1990	145.57	133.44	12.13	11.10	114.43	1.85	NE	0.16	NO	273.11	0.18
1991	149.61	136.55	13.07	12.58	96.93	1.85	NE	0.16	NO	261.12	0.20
1992	143.74	130.72	13.02	13.78	78.54	1.79	NE	0.15	NO	237.99	0.22
1993	142.64	129.90	12.74	15.05	79.91	1.76	NE	0.14	NO	239.51	0.24
1994	134.17	124.04	10.13	13.57	75.02	1.81	NE	0.14	NO	224.70	0.25
1995	129.54	120.86	8.68	11.95	81.27	1.82	NE	0.13	NO	224.71	0.29
1996	126.65	118.89	7.75	10.37	77.47	1.80	NE	0.12	NO	216.41	0.34
1997	108.37	101.17	7.21	9.06	83.48	1.88	NE	0.11	NO	202.92	0.37
1998	99.85	94.17	5.68	7.71	75.46	1.84	NE	0.11	NO	184.97	0.40
1999	95.16	90.21	4.95	6.04	69.41	1.88	NE	0.11	NO	172.59	0.39
2000	87.40	82.43	4.97	4.96	82.35	1.79	NE	0.10	NO	176.59	0.42
2001	82.48	79.36	3.12	4.38	86.90	1.86	NE	0.10	NO	175.72	0.41
2002	76.04	72.78	3.26	4.57	95.77	1.86	NE	0.10	NO	178.34	0.37
2003	72.84	69.62	3.22	4.26	97.69	1.73	NE	0.10	NO	176.62	0.34
2004	67.40	64.36	3.04	4.40	83.58	1.98	NE	0.09	NO	157.44	0.40
2005	67.92	65.06	2.86	4.71	88.39	1.86	NE	0.09	NO	162.97	0.47
2006	61.72	58.84	2.88	4.87	103.73	1.79	NE	0.08	NO	172.19	0.50
2007	59.06	56.57	2.49	4.89	95.06	1.79	NE	0.08	NO	160.88	0.53
2008	56.66	54.41	2.25	4.74	97.11	1.95	NE	0.07	NO	160.53	0.52

Table A.II-4: NH₃ [Gg] 1990–2008.

	NFR-Sectors according to NEC directive									NATIONAL TOTAL	International Bunkers
	1	1 A	1 B	2	3	4	5	6	7		
	ENERGY	FUEL COMBUSTION ACTIVITIES	FUGITIVE EMISSIONS FROM FUELS	INDUSTRIAL PROCESSES	SOLVENT AND OTHER PRODUCT USE	AGRICULTURE	LAND USE CHANGE AND FORESTRY	WASTE	OTHER		
1990	4.03	4.03	IE	0.27	NA	60.80	NE	0.36	NO	65.46	0.00
1991	5.27	5.27	IE	0.51	NA	61.59	NE	0.37	NO	67.73	0.00
1992	6.38	6.38	IE	0.37	NA	59.69	NE	0.42	NO	66.86	0.00
1993	7.48	7.48	IE	0.22	NA	60.23	NE	0.50	NO	68.43	0.00
1994	8.47	8.47	IE	0.17	NA	61.16	NE	0.57	NO	70.36	0.00
1995	8.37	8.37	IE	0.10	NA	62.14	NE	0.58	NO	71.19	0.00
1996	8.21	8.21	IE	0.10	NA	60.51	NE	0.60	NO	69.42	0.00
1997	7.76	7.76	IE	0.10	NA	61.16	NE	0.59	NO	69.61	0.00
1998	7.29	7.29	IE	0.10	NA	61.53	NE	0.60	NO	69.53	0.00
1999	6.82	6.82	IE	0.12	NA	60.06	NE	0.64	NO	67.64	0.00
2000	6.18	6.18	IE	0.10	NA	58.15	NE	0.66	NO	65.09	0.00
2001	5.70	5.70	IE	0.08	NA	58.13	NE	0.74	NO	64.65	0.00
2002	5.07	5.07	IE	0.06	NA	57.37	NE	0.81	NO	63.32	0.00
2003	4.61	4.61	IE	0.08	NA	57.38	NE	0.88	NO	62.95	0.00
2004	4.11	4.11	IE	0.06	NA	56.87	NE	1.17	NO	62.20	0.00
2005	3.84	3.84	IE	0.07	NA	56.87	NE	1.29	NO	62.07	0.00
2006	3.44	3.44	IE	0.07	NA	57.23	NE	1.35	NO	62.11	0.00
2007	3.20	3.20	IE	0.08	NA	58.40	NE	1.40	NO	63.08	0.00
2008	3.02	3.02	IE	0.08	NA	58.05	NE	1.41	NO	62.57	0.00

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Mit dem Report „Austria’s Annual Air Emission Inventory 1990–2008“ präsentiert das Umweltbundesamt die Entwicklung jener Luftschadstoffe, für die gemäß der NEC-Richtlinie nationale Emissionshöchstgrenzen (National Emission Ceilings, NEC) für 2010 festgelegt sind.

Die Ergebnisse der Österreichischen Luftschadstoff-Inventur zeigen für Schwefeldioxid (SO₂) zwischen 2007 und 2008 eine deutliche Abnahme um 9,2 %. Die Stickoxidemissionen (NO_x) sanken im selben Zeitraum um 2,7 %. Auch bei den Ammoniakemissionen (NH₃) ist ein geringfügiger Rückgang um 0,8 % zu verzeichnen, die flüchtigen Kohlenwasserstoffe ohne Methan (NMVOC) blieben von 2007 auf 2008 annähernd konstant (–0,2 %).

Die nationalen Höchstmengen werden bei SO₂ und NH₃ bereits unterschritten, die NMVOC-Emissionen lagen 2008 geringfügig, die NO_x-Emissionen deutlich darüber.