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NEC Directive status report 2012

Reporting by the Member States under Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants

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European Environment Agency

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European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark
Tel.: +45 33 36 71 00
Fax: +45 33 36 71 99
Web: eea.europa.eu
Enquiries: eea.europa.eu/enquiries

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The EEA project manager was Martin Adams.

The desk officer at the European Commission's Directorate-General for the Environment responsible for implementation of the National Emission Ceilings Directive (NECD) is André Zuber.

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Executive summary

This report describes the most recent emission inventory information provided by the Member States of the European Union at the end of 2012 under Directive 2001/81/EC, the National Emission Ceilings Directive (NECD) (EC, 2001).

The NECD requires all 27 Member States to report information annually concerning emissions for four important air pollutants: nitrogen oxides (NO_X), non-methane volatile organic compounds (NMVOC), sulphur dioxide (SO_2) and ammonia (NH_3). These pollutants can cause respiratory problems, contribute to the acidification and eutrophication of soil and surface water, and damage vegetation by exposure from tropospheric ozone resulting from these emissions. To help protect human health and the environment, the NECD sets pollutant-specific and legally binding emission ceilings for each of these pollutants and for each country, which were to be met by 2010 and in future years.

Comparison of emissions data reported by Member States with the emission ceilings of the NECD

Each year by 31 December, Member States are required to report their national emission inventories for the four NECD pollutants. More specifically, final emission data should be submitted for the previous year but one, as well as provisional emission data for the previous year. At the end of 2012 therefore, Member States were required to report final emission data for the year 2010, and provisional estimates of emissions for 2011.

Analysis of the official 'final' 2010 data confirms eleven Member States exceeded their respective NO_X ceilings for that year (Austria, Belgium, Denmark, France, Germany, Ireland, Luxembourg, Malta, Netherlands, Spain and Sweden) (see Table ES.1). Seven of these Member States (Austria, Belgium, France, Germany, Ireland, Luxembourg and Spain) continued to breach this ceiling in 2011, in some instances by significant amounts. In absolute amounts Germany and France reported the highest exceedances of the NO_X ceilings in 2011, by 242 and 195 kilotonnes respectively. In percentage terms, Austria (40 %) and Luxembourg (64 %) continued to exceed their NO_X emission ceilings the most in 2011.

Denmark and Germany were the only two Member States to have exceeded three of the four emission ceilings under the directive in 2010 (for NO_X, NMVOC and NH_3) (Table ES.1), although Denmark subsequently brought emissions below the ceilings for each of these pollutants according to the provisional 2011 data. Germany continued to exceed three of its four emission ceilings. Spain exceeded two ceilings (for NO_X and NH_3) in 2010 and 2011. All Member States have achieved the emission ceilings for SO_2. In total, eight Member States exceeded one or more of the emission limits in 2011, four fewer than in 2010.

The road transport sector is one of the main contributory factors behind the large number of NO_X exceedances, as reductions of NO_X from this sector over the last two decades have not been as large as originally anticipated. This is partly because the sector has grown more than expected and partly because of the increased penetration of diesel vehicles that have higher NO_X emissions than petrol-fuelled vehicles and for which vehicle emission standards have not always delivered the anticipated level of reductions (EEA, 2011).

Compared to the previous reporting cycle when only provisional 2010 data was available ([1]), several Member States reported revised final 2010 emissions data which now changes the status of whether emission ceilings were attained:

- Last year Denmark reported provisional 2010 emissions of NMVOC and NH_3 lower than the respective ceilings, but the final 2010 data for that year now shows emissions were slightly above the level of the ceilings.

([1]) References to 'provisional 2010 data' in this report refer to data for 2010 reported in the prior (2011) reporting round and which were documented in the previous annual NEC Directive status report 2011 (EEA, 2012).

Table ES.1 Progress by EU Member States in meeting the emission ceilings of the NECD

Member State	NO_x		NMVOC		SO_2		NH_3	
	2010	2011	2010	2011	2010	2011	2010	2011
Austria	×	×	✓	✓	✓	✓	✓	✓
Belgium	×	×	✓	✓	✓	✓	✓	✓
Bulgaria	✓	✓	✓	✓	✓	✓	✓	✓
Cyprus	✓	✓	✓	✓	✓	✓	✓	✓
Czech Republic	✓	✓	✓	✓	✓	✓	✓	✓
Denmark	×	✓	×	✓	✓	✓	×	✓
Estonia	✓	✓	✓	✓	✓	✓	✓	✓
Finland	✓	✓	✓	✓	✓	✓	×	×
France	×	×	✓	✓	✓	✓	✓	✓
Germany	×	×	×	×	✓	✓	×	×
Greece	✓	✓	✓	✓	✓	✓	✓	✓
Hungary	✓	✓	✓	✓	✓	✓	✓	✓
Ireland	×	×	✓	✓	✓	✓	✓	✓
Italy	✓	✓	✓	✓	✓	✓	✓	✓
Latvia	✓	✓	✓	✓	✓	✓	✓	✓
Lithuania	✓	✓	✓	✓	✓	✓	✓	✓
Luxembourg	×	×	✓	✓	✓	✓	✓	✓
Malta	×	✓	✓	✓	✓	✓	✓	✓
Netherlands	×	✓	✓	✓	✓	✓	✓	✓
Poland	✓	✓	✓	✓	✓	✓	✓	✓
Portugal	✓	✓	✓	✓	✓	✓	✓	✓
Romania	✓	✓	✓	✓	✓	✓	✓	✓
Slovakia	✓	✓	✓	✓	✓	✓	✓	✓
Slovenia	✓	✓	✓	✓	✓	✓	✓	✓
Spain	×	×	✓	✓	✓	✓	×	×
Sweden	×	✓	✓	✓	✓	✓	✓	✓
United Kingdom	✓	✓	✓	✓	✓	✓	✓	✓
✓	**16**	**20**	**25**	**26**	**27**	**27**	**23**	**24**
×	**11**	**7**	**2**	**1**	**0**	**0**	**4**	**3**

Notes: '✓' indicates that the final (2010) or provisional (2011) emission data reported by a Member State meet or lie below its respective emission ceiling.
'×' indicates that a ceiling is not met.

- Provisional 2010 emission data (submitted in 2011) indicated that Finland did not achieve its NO_X emission ceiling. However, the recently-submitted final 2010 emission data now indicate that Finnish NO_X emissions are below its ceiling. The reported exceedance indicated by the provisional 2010 data was due to an error since corrected, following recalculations and further cross-checking.

- Germany's provisional NH_3 2010 emission data also were below the ceiling, but final 2010 data lie above. The change is mainly due to statistical improvements in the methodology used to estimate emissions from livestock.

- Spain reported final 2010 NMVOC emissions 7.8 % lower than the provisional 2010 data, moving total emissions for that year below the level of the ceiling. Substantial changes made across a number of emission inventory sectors were responsible for the large change in recalculated emissions, including changes to emission factors used to estimate NMVOC emissions from the 'solvents and other product use' sector, changed activity data from refineries, and in the road transport sector revision of emission factors due to updating to newer versions of the COPERT4 methodology used to estimate vehicle emissions.

Progress of the European Union in meeting its emission ceilings

The EU itself has two different sets of emission ceilings for 2010 and onwards defined in the NECD ([2]).

The less stringent ceilings of Annex I to the NECD are not exceeded on the basis of either the reported final 2010 or provisional 2011 emissions data (Figure ES.1). This is a change compared to the provisional 2010 emission data available last year, where the total EU emissions were slightly higher (0.1 %) above the Annex I NO_X emission ceiling (EEA, 2012).

Of the three stricter Annex II emission ceilings designed with the aim of attaining the interim environmental objectives of the NECD by 2010, only for NO_X is the aggregated EU emissions data above the respective ceiling for both final 2010 and provisional 2011.

Specifically for the four NECD pollutants:

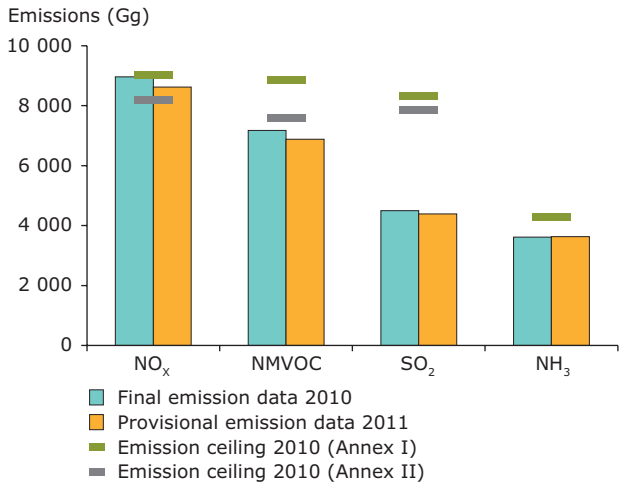
- Final EU-27 NO_X 2010 emissions are 0.5 % below the aggregated emission ceiling given in Annex I (calculated by aggregating the individual Member State ceilings) but 9.5 % above the stricter Annex II ceiling of the NECD for the EU-27 as a whole. Provisional EU-27 NO_X 2011 emissions are 4.3 % below the aggregated emission ceiling of Annex I, but exceed by 5.3 % the stricter Annex II ceiling for the EU-27 as a whole.

- NMVOC final 2010 emission data for the EU-27 are 19.0 % below the aggregated emission ceiling given in Annex I, and 5.5 % below the Annex II ceiling; the EU-27 provisional 2011 NMVOC emission data are 22.3 % below the Annex I and 9.3 % below the Annex II NMVOC ceiling.

- Both final and provisional SO_2 emission data are significantly below the levels of the Annex I and II emissions ceilings, by just under 50 %.

- the NH_3 final 2010 emission data are 15.9 % below the EU-27 Annex I emission ceiling, and the provisional 2011 data are 15.4 % below; there is no separate ceiling for NH_3 defined in Annex II to the NECD.

Figure ES.1 Progress of the EU-27 in meeting the emission ceilings defined in NECD Annexes I and II



Note: Provisional and final emissions data represent the aggregation of emissions data reported by the EU Member States. The aggregated emission estimates are a mix of emission data reported on the basis of fuel used (six Member States) and fuel sold (21 Member States) for mobile sources. An overview of the basis used by Member States for estimating emissions from mobile sources is given in Table 2.6.

Progress of non-EU countries in meeting emission ceilings under the Gothenburg Protocol to the UNECE LRTAP Convention

Three non-EU EEA member countries (Liechtenstein, Norway and Switzerland) have emissions ceilings for 2010 and onwards specified under the Gothenburg Protocol of the United Nations Economic Commission for Europe (UNECE) 1979 Convention on Long-range Transboundary Air Pollution (LRTAP) (UNECE, 1979). Data reported by these countries show that Liechtenstein and Norway have missed their NO_X and NH_3 emissions ceilings in 2010 and 2011, while Switzerland exceeded only its NH_3 ceiling in 2010, but achieved all ceilings in 2011 (Table ES.2).

([2]) Annexes I and II to the NECD define aggregated emission ceilings for the EU-27. The Annex I EU-27 ceilings represent the aggregation of individual Member State ceilings defined in that annex. The Annex II EU-27 ceilings are stricter than those of Annex I and are designed with the aim of attaining, by 2010, for the European Union as a whole, the interim environmental objectives set out in Article 5 of the NECD (i.e. a reduction of acidification and health- and vegetation-related ground-level ozone exposure by 2010, compared with the 1990 situation). There is no separate ceiling for NH_3 defined in Annex II to the NECD.

Table ES.2 Progress by other EEA member countries in meeting the emission ceilings set in the UNECE LRTAP Convention Gothenburg Protocol

Country	NO_x		NMVOC		SO_2		NH_3	
	2010	2011	2010	2011	2010	2011	2010	2011
Liechtenstein	×	×	✓	✓	✓	✓	×	×
Norway	×	×	✓	✓	✓	✓	×	×
Switzerland	✓	✓	✓	✓	✓	✓	×	✓

Note: '✓' indicates that the final (2010) or provisional (2011) emission data reported by a country meet or lie below its respective emission ceiling.

'×' indicates that a ceiling is not met.

Emission data for Liechtenstein, Norway and Switzerland are the latest reported data under the LRTAP Convention and are compared with the respective listed emission ceilings of the Gothenburg Protocol. Liechtenstein has signed but not yet ratified the protocol. Of the remaining EEA member countries, neither Iceland nor Turkey has yet signed the Gothenburg Protocol.

Past emission trends

Under the NECD, Member States must formally submit only two years of emission data. This therefore hampers any reliable assessment of long-term emission trends (either within individual Member States or for the EU-27 as a whole). Nevertheless, several Member States do submit updated emission data for all years as far back as 1990. The majority of the EU Member States that reported data back to 1990 report considerable emission reductions of the four NECD pollutants since 1990. A more complete picture of past emission trends in the European Union will be provided in mid-2013 when the EEA publishes its annual European Union emission report under the UNECE LRTAP Convention (EEA, 2013a).

Completeness of data reporting

a) Assessment of possible underestimation.
The international reporting guidelines of the UNECE LRTAP Convention (UNECE, 2009) (and through Annex III of the NECD, by extension applicable also to reporting under the NECD) allow Member States to report emissions as 'not estimated' (NE) for sectors where emissions are known to occur but have not been estimated or reported. Ideally 'NE' should only be used for sources that are very small in the respective Member State, where, for example, it may not be cost effective to develop a specific estimation methodology compared with improving the accuracy of estimates for more significant sources.

By definition, use of the 'NE' notation key means national inventories are incomplete and emissions totals are therefore underestimated. Section 2.7 of this report describes a simple assessment of the possible magnitude of this underestimation. By adding an estimate of the potential underestimation to the reported Member State total, an indication can be obtained as to whether the difference in emissions is likely to affect the number of Member States attaining their ceilings.

For most Member States, the addition of the potential underestimate to their national totals does not change the evaluation of whether a Member State's emissions are above or below the emission ceilings i.e. in general the potential underestimation is low for all pollutants. However, for certain Member States the addition of the potential underestimation increases the 2011 emissions above the level of the respective ceiling. These Member States are Denmark (for NO_X and NH_3), the Netherlands (NO_X), Portugal (NMVOC) and Slovenia (NO_X).

Similarly, applying the same analysis to the final 2010 data shows that for two Member States, the addition of the potential underestimate to the national totals increases emissions above the level of the respective 2010 ceiling. This is the case for Portugal (NMVOC) and Slovenia (NO_X).

While this methodology to assess the potential under-estimate is recognised as a simple analysis, it provides a useful initial indicator of where underestimations might have occurred, and where the estimated emissions should therefore be investigated in more detail. It is a cause of concern that for some Member States, the estimation of the incomplete emissions may lead to exceedances above emission ceilings.

b) Pollutant–source combinations not included in the original 2010 emission ceilings. Since the original integrated assessment modelling undertaken to support the determination of the 2010 emissions ceilings, improved knowledge has become available on the sources of air pollutants. In several instances, 'new' emission source categories for the pollutants covered within the scope of the NECD have been recognised, and in some cases, on the basis of subsequent measurements, emission factors have been developed that now enable emission estimates to be made.

An in-depth analysis was performed for two such cases, NO_X and NMVOC emissions from the agriculture sector, in order to define the magnitude of these compared with the national totals and national emissions ceilings. Based on the NO_X emission estimates provided by 17 Member States, NO_X from agriculture contributes to less than 10 % to the respective national totals. NMVOC emissions from agriculture (provided by 17 Member States) have a higher contribution, up to 34 % of total emissions. The analysis demonstrates that incomplete reporting coupled with the apparent significant contribution of such sources to the national total in those Member States where data are available, may well cause emissions to be underestimated (in some cases significantly) in a number of Member States.

At the EU level however, the subtraction of NO_X and NMVOC emissions from the agriculture sector has only a minor impact (Table ES.3). These 2011 emissions amount to 2.1 % and 2.4 % of the total emissions of NO_X and NMVOC respectively, and for NO_X their removal would not bring the EU emissions below the level of the Annex II NO_X ceiling.

Transparency of reported information

Providing inventory reports or additional explanatory information that describes the methods and sources of the reported data is not mandatory under the NECD; this limits the transparency of submitted data. Nevertheless, ten Member States (Austria, Finland, Germany, Latvia, the Netherlands, Poland, Romania, Slovakia, Spain and Sweden) voluntarily submitted an inventory report together with their NECD inventories.

Public access to data and reports

Data described in this report are available from the EEA online data viewer (EEA, 2013b).

The EEA also publishes individual fact sheets (EEA, 2013c) for each Member State providing additional analysis of various parameters: emissions per GDP, emissions per capita, and current progress towards achieving the respective emission ceilings for each pollutant etc.

Table ES.3 Effect on NO_x and NMVOC emissions of the 'new' emission source category 'agriculture' on EU total emissions

in Gg	NO_x		NMVOC	
	2010	2011	2010	2011
EU-27 emissions as reported	8 957	8 618	7 169	6 878
Amount of the agriculture sector	171	180	169	168
EU-27 without emissions from the agriculture sector	**8 786**	**8 438**	**7 000**	**6 710**
Annex I emission ceiling	9 003	9 003	8 848	8 848
Annex II emission ceiling	8 180	8 180	7 585	7 585

Units and abbreviations

CDR	Eionet Central Data Repository
CEIP	EMEP Centre on Emission Inventories and Projections
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
EEA	European Environment Agency
Eionet	European Environmental Information and Observation Network of the EEA
EMEP	Cooperative programme for monitoring and evaluation of the long-range transmissions of air pollutants in Europe
ETC/ACM	European Topic Centre for Air Pollution and Climate Change Mitigation
EU	European Union
GDP	gross domestic product
Gg	1 gigagram = 10^9 g = 1 kiloton (kt)
HFCs	hydrofluorocarbons
HMs	heavy metals
IIR	Informative Inventory Report
LRTAP Convention	UNECE Convention on Long-range Transboundary Air Pollution
NE	not estimated
NECD	National Emission Ceilings Directive
NFR	nomenclature for reporting (UNECE)
NH_3	ammonia
NMVOC	non-methane volatile organic compounds
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
PFCs	perfluorocarbons
PM	particulate matter
POPs	persistent organic pollutants
SF_6	sulphur hexafluoride
SO_2	sulphur dioxide
SO_X	sulphur oxides
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
VOC	volatile organic compounds (non-methane)

1 Introduction

'The aim (of the National Emission Ceilings Directive) is to limit emissions of acidifying and eutrophying pollutants and ozone precursors in order to improve the protection in the Community of the environment and human health... by establishing national emission ceilings…'

Directive 2001/81/EC, the National Emission Ceilings Directive (NECD) (EC, 2001) highlights the importance of reporting air pollutant emission data for assessing progress in reducing air pollution in the European Union ([3]) and for ascertaining the compliance of the Member States with their commitments.

This report provides an overview of emission data submitted by Member States under the NECD. It also presents a comparison of the emission ceilings of nitrogen oxides (NO_X), non-methane volatile organic compounds (NMVOC) ([4]), sulphur dioxide (SO_2), and ammonia (NH_3) emissions and the reported emission data for 2010 and 2011. A summary of progress made by selected non-EU EEA Member Countries ([5]) towards emission ceilings defined in the Gothenburg Protocol of the LRTAP Convention Long-range Transboundary Air Pollution (UNECE, 1979) is also provided.

1.1 Reporting requirements under the NECD

Articles 2, 6, 7 and 8 of the NECD set forth the requirements for the EU-27 Member States concerning national inventories, projections and programmes. According to these provisions, Member States shall prepare and annually update national total emissions estimates for the pollutants NO_X, NMVOC, SO_2, and NH_3. In previous years, Member States were also required to report projected emissions for the year 2010 for all four pollutants (this provision is now obsolete). In addition, by 31 December each year, the Member States shall report to the European Commission and the EEA these national emission inventories; final emission data should be submitted for the previous year but one, as well as provisional emission data for the previous year.

Member States were obliged to report their updated national programmes for progressive reduction of national emissions of NO_X, NMVOC, SO_2, and NH_3 to the European Commission by the end of 2006. The reported national programmes should have included information on policies (adopted and envisaged) and quantified estimates of the effect of these policies and measures on emissions of those pollutants in 2010. A detailed evaluation of the reported NECD programmes was performed in 2007 for the European Commission. It analysed projections and programmes submitted by the Member States and the measures they planned to implement (AEA Technology, 2007).

To help ensure that information on emissions reported by Member States is consistent and harmonised, the NECD further states that the Member States shall establish emission inventories using the methodologies agreed upon by the 1979 United Nations Economic Commission for Europe (UNECE) LRTAP Convention. It also requests (in Annex III to the NECD) that, in preparing these inventories and projections, Member States use the latest version of the *EMEP/Corinair emission inventory guidebook*, since renamed the *EMEP/EEA air pollutant emission inventory guidebook* (EMEP/EEA, 2009).

It is considered good practice that, in preparing emission inventories and projections under the NECD, Member States apply the principles outlined in the United Nations Economic Commission for Europe (UNECE) guidelines for reporting emission data under the LRTAP Convention (UNECE, 2009). The historic emission data presented must be 'transparent, consistent, comparable, complete and accurate'.

([3]) Throughout this report, the term 'European Union' refers to the 27 Member States as of 31 December 2012: Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom.
([4]) The NECD defines VOC as being non-methane volatile organic compounds (NMVOC).
([5]) Non-EU EEA member countries are Iceland, Liechtenstein, Norway, Switzerland and Turkey.

1.1.1 Scope

The NECD covers emissions from all sources of NO_X, NMVOC, SO_2, and NH_3, which arise as a result of human activities within the territory of the Member States and their exclusive economic zones, except:

- emissions from international maritime traffic;
- aircraft emissions beyond the landing and take-off cycle;
- for Spain, emissions in the Canary Islands;
- for France, emissions in the overseas departments;
- for Portugal, emissions in Madeira and the Azores.

1.1.2 Preparation of the annual NECD status report and access to information

As specified in Article 7 of the NECD, the European Commission, assisted by the EEA, shall, in cooperation with Member States and based on information provided by them, establish inventories and projections for the relevant pollutants.
A description of the quality assurance/quality control activities compilation of the EU inventory, together with a description of the institutional arrangements and dataflow which underpin the preparation of this report are available in EEA (2012).

The NECD also requires that the inventories and projections shall be made publicly available. Data described in this report are available from an EEA online data viewer (EEA, 2013b) and also separately in database files for download.

1.1.3 Differences between NECD, LRTAP Convention and UNFCCC inventory reporting

In addition to reporting emission data under the NECD, Member States are also required to report emissions of certain pollutants under two other international reporting obligations: the UNECE LRTAP Convention (UNECE, 1979), and the EU Monitoring Mechanism (EC, 2004) and its implementing provisions (EC, 2005). Table 1.1 provides an overview of Member States' air pollution reporting obligations.

These three reporting obligations differ mainly in the number and type of air pollutants for which reporting is required, the geographical coverage of countries (e.g. the inclusion or not of overseas dependencies in the territories of France, Portugal, Spain or the United Kingdom), and the inclusion of domestic and international aviation and navigation in the national total. The NECD, LRTAP Convention and UNFCCC inventories differ in terms of the pollutants included, and slightly in terms of the sectors included in the official national totals. The major differences are summarised in Table 1.2.

Table 1.1 Overview of air pollutant emission reporting obligations in the EU

Legal obligation	Emission-reporting requirements	Annual reporting deadline for EU Member States	Annual reporting deadline for the EU
NECD	Emissions of NO_X, NMVOC, SO_2 and NH_3	31 December	n/a
LRTAP Convention	Emissions ([a]) of NO_X (as nitrogen dioxide (NO_2)), NMVOC, sulphur oxides (SO_X) (as SO_2), NH_3, carbon monoxide (CO), heavy metals (HMs), persistent organic pollutants (POPs) and particulate matter (PM)	15 February	30 April
EU Monitoring Mechanism/ UNFCCC	Emissions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulphur hexafluoride (SF_6), NO_X, CO, NMVOC and SO_2	15 January (to the European Commission) 15 April (to the UNFCCC)	15 April

Note: ([a]) Parties are formally required to report only on the substances and for the years set forth in protocols that they have ratified and that have entered into force.

Table 1.2 Major differences between reporting obligations of LRTAP Convention, NECD and Council Decision No 280/2004/EC

Source categories	Included in national totals	Not included in national totals but reported as a 'memo item'
Domestic aviation (landing and take-off)	NEC, LRTAP, UNFCCC	n/a
Domestic aviation (cruise)	UNFCCC	NEC, LRTAP
International aviation (landing and take-off)	NEC, LRTAP	UNFCCC
International aviation (cruise)	n/a	NEC, LRTAP, UNFCCC
National navigation (domestic shipping)	NEC, LRTAP, UNFCCC	n/a
International inland shipping	NEC, LRTAP	UNFCCC
International maritime navigation	n/a	NEC, LRTAP, UNFCCC
Road transport (fuel sold *)	NEC **, LRTAP **, UNFCCC	n/a

Note: NEC: NO_X, NMVOC, SO_2 and NH_3.

LRTAP: NO_X, NMVOC, SO_X, NH_3, CO, HMs, POPs and PM.

UNFCCC: CO_2, CH_4, N_2O, HFCs, PFCs, SF_6,NO_X, NMVOC, SO_2 and CO.

(*) In addition, Member States may also report emission estimates based on fuel used as an additional 'memo item'.

(**) Austria, Belgium, Ireland, Lithuania, Luxemburg, the Netherlands, Switzerland and the United Kingdom may choose to use the national emission total calculated on the basis of fuels used instead of fuels sold in the geographic area of the Party as a basis for compliance (UNECE, 2009).

1.2 Emission ceilings

By 2010 at the latest, Member States shall have limited their annual emissions of NO_X, NMVOC, SO_2, and NH_3 to the ceilings defined in the directive. Member States shall ensure that the emission ceilings are not exceeded in any year after 2010. In this report, final 2010 emission data and provisional 2011 emission data reported by Member States are compared with the emission ceilings defined in Annex I to the NECD. Emission ceilings for the individual Member States and for the EU-27 as a whole (as defined in Annexes I and II to the NECD) are shown in Table 1.3 and Table 1.4.

The emission ceilings given in Annex II to the NECD (Table 1.4) are designed with the aim of attaining the European Union's interim environmental objectives set out in Article 5 of the NECD by 2010. Meeting those objectives is expected to result in reduced acidification and reduced health- and vegetation-related ground-level ozone exposure by 2010, compared with the situation in 1990. The Annex II emission ceilings for the European Union are stricter than the aggregated Member State emission ceilings given in NECD Annex I. There is no ceiling for NH_3 in Annex II of the NECD.

Table 1.3 National 2010 emission ceilings for NO_x, NMVOC, SO_2 and NH_3 as defined in NECD Annex I

Member State	NO_x (Gg)	NMVOC (Gg)	SO_2 (Gg)	NH_3 (Gg)
Austria	103	159	39	66
Belgium	176	139	99	74
Bulgaria	247	175	836	108
Cyprus	23	14	39	9
Czech Republic	286	220	265	80
Denmark	127	85	55	69
Estonia	60	49	100	29
Finland	170	130	110	31
France	810	1 050	375	780
Germany	1 051	995	520	550
Greece	344	261	523	73
Hungary	198	137	500	90
Ireland	65	55	42	116
Italy	990	1 159	475	419
Latvia	61	136	101	44
Lithuania	110	92	145	84
Luxembourg	11	9	4	7
Malta	8	12	9	3
Netherlands	260	185	50	128
Poland	879	800	1 397	468
Portugal	250	180	160	90
Romania	437	523	918	210
Slovakia	130	140	110	39
Slovenia	45	40	27	20
Spain	847	662	746	353
Sweden	148	241	67	57
United Kingdom	1 167	1 200	585	297
EU-27	**9 003**	**8 848**	**8 297**	**4 294**

Table 1.4 EU 2010 emission ceilings for NO_x, NMVOC and SO_2 as defined in NECD Annex II

Region	NO_x (Gg)	NMVOC (Gg)	SO_2 (Gg)
EU-27	8 180	7 585	7 832

2 Assessment of EU and Member State emissions

This chapter presents the comparison of emissions and ceilings, and emission trends of NO_X, NMVOC, SO_2 and NH_3, as reported by the Member States under the NECD. Appendices 1–3 provide an overview of the data available up to and including 9 April 2013 from the current NECD reporting round used in this report. Data provided in previous reporting cycles is not considered in this report.

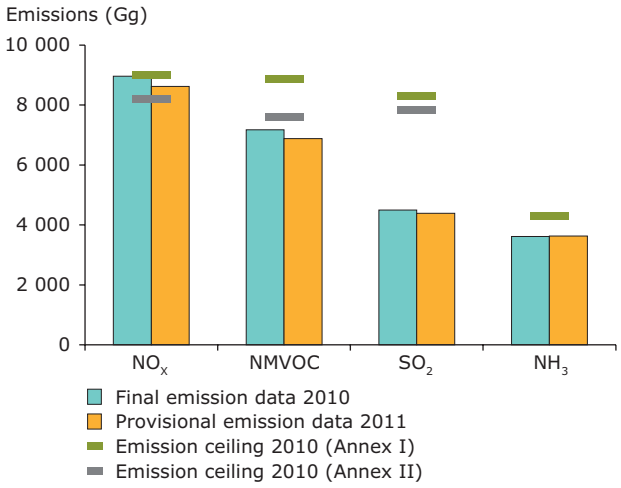
2.1 Progress of the European Union in meeting emission ceilings

Figure 2.1, Table 2.1 and Table 2.2 illustrate the progress of the EU-27 towards meeting its emission ceilings specified in Annexes I and II to the NECD. For all pollutants, the final 2010 and provisional 2011 emission data are lower than the respective aggregated 2010 ceiling (Annex I to the NECD). This differs compared to last year's assessment (EEA, 2012), in which the provisional 2010 emission data ([6]) for NO_X were slightly higher (0.1 %) above the emission ceiling. The downward reduction in NO_X emissions is mainly attributable to a revision of the Romanian NO_X emissions from road transport.

Of the three stricter Annex II emission ceilings designed with the aim of attaining the NECD's interim environmental objectives by 2010, NO_X emission data are above the respective ceiling, for both the final 2010 and provisional 2011 data (Figure 2.1, Table 2.1 and Table 2.2).

In order that the EU-27 also meets its Annex II NO_X emission ceiling, a further reduction of 5.1 % from 2011 emission levels is required (Table 2.2). There is some uncertainty underlying this number as the assessment is based on provisional 2011 emission data. Final 2011emission data will be reported at the end of 2013. Evaluation of previous submissions shows that the range of recalculations can be expected to be in the range of a few percent. As an example, a comparison of provisional 2010 emission data (submitted in 2011) and final 2010 emission data (submitted in 2012) (see Table 2.4) showed that for NO_X, NMVOC and SO_2, emissions were slightly lower in the final estimate (– 0.7 % for NO_X, – 3.1 % for NMVOC and – 1.1 % for SO_2). For NH_3, recalculations in the national emission inventories led to a slight increase of + 0.9 % at the EU-27 level. Some individual Member States reported very large differences between the provisional 2010 and final 2010 data: Latvia had the highest change (– 55 % for SO_2), followed by Luxembourg (+ 31 % for SO_2), Portugal (– 21 % for SO_2) and Romania (– 20 % for NO_X).

Figure 2.1 Progress of the EU-27 in meeting the emission ceilings defined in NECD Annexes I and II



Note: The emission ceilings shown are the aggregated EU-27 emission ceilings defined in Annexes I and II to the NECD ([7]). Annex II to the NECD does not define a ceiling for NH_3.

([6]) References to 'provisional 2010 data' in this report refer to data for 2010 reported in the prior (2011) reporting round and which were documented in the previous annual NECD status report (EEA, 2012).

([7]) Annexes I and II to the NECD define aggregated emission ceilings for the EU-27. The Annex I EU-27 ceilings represent the aggregation of individual Member State ceilings defined in that annex. The Annex II EU-27 ceilings are stricter than those of Annex I and are designed with the aim of attaining, by 2010, for the European Union as a whole, the interim environmental objectives set out in Article 5 of the NECD (i.e. a reduction of acidification and health- and vegetation-related ground-level ozone exposure by 2010, compared with the 1990 situation). There is no separate ceiling for NH_3 defined in Annex II to the NECD.

Table 2.1 Comparison of aggregated EU-27 final 2010 emission data with emission ceilings

	Final 2010 emission data (Gg)	Annex I emission ceilings (Gg)	Difference from emissions (Gg)	Difference from emissions (%)	Annex II emission ceilings (Gg)	Difference from emissions (Gg)	Difference from emissions (%)
NO_X	8 957	9 003	– 46	– 0.5 %	8 180	777	9.5 %
NMVOC	7 169	8 848	– 1 679	– 19.0 %	7 585	– 416	– 5.5 %
SO_2	4 494	8 297	– 3 803	– 45.8 %	7 832	– 3 338	– 42.6 %
NH_3	3 612	4 294	– 682	– 15.9 %			

Note: The emission ceilings shown are the aggregated EU-27 emission ceilings defined in Annexes I and II to the NECD. Annex II to the NECD does not define a ceiling for NH_3.

Table 2.2 Comparison of aggregated EU-27 provisional 2011 emission data with emission ceilings

	Provisional 2011 emission data (Gg)	Annex I emission ceilings (Gg)	Difference from emissions (Gg)	Difference from emissions (%)	Annex II emission ceilings (Gg)	Difference from emissions (Gg)	Difference from emissions (%)
NO_X	8 618	9 003	– 385	– 4.3 %	8 180	438	5.3 %
NMVOC	6 878	8 848	– 1 970	– 22.3 %	7 585	– 707	– 9.3 %
SO_2	4 385	8 297	– 3 912	– 47.1 %	7 832	– 3 447	– 44.0 %
NH_3	3 633	4 294	– 661	– 15.4 %			

Note: The emission ceilings shown are the aggregated EU-27 emission ceilings defined in Annexes I and II to the NECD. Annex II to the NECD does not define a ceiling for NH_3.

2.2 Comparison of emissions data reported by Member States with the emission ceilings of the NECD

Table 2.3 provides an overview of Member State final 2010 and provisional 2011 emission data submitted under the NECD in comparison with the emission ceilings.

Analysis of the official 'final' 2010 data confirms eleven Member States exceeded their respective NO_X ceilings for that year (Austria, Belgium, Denmark, France, Germany, Ireland, Luxembourg, Malta, Netherlands, Spain and Sweden). Seven Member States: Austria, Belgium, France, Germany, Ireland, Luxembourg and Spain) continued to exceed the ceiling in 2011. The highest exceedance in percentage terms was reported for Luxembourg (64 %) — see also Figure 2.2.

Provisional 2011 emission data of NMVOC are above the ceilings for only one Member State (Germany, 1.3 %, Figure 2.3), while for NH_3 three Member States exceeded their ceilings in 2011 (Germany (2.4 %), Spain (7.8 %) and Finland (20 %), Figure 2.5).

All Member States have achieved the emission ceilings for SO_2 — see also Figure 2.4.

In summary, final 2010 emission data show, that twelve Member States exceeded one or more of the emission limits set by the NECD. On the basis of the provisional 2011 data, eight Member States reported emission data above the ceiling for at least one pollutant. Thus, between 2010 (final data) and 2011 (provisional data), four Member States (Denmark, Malta, the Netherlands and Sweden) reported emissions below the emission ceilings.

Comparing provisional 2010 data with the final 2010 data, recalculations to emission data made by Germany, Finland and Spain have changed their status for NH_3, NO_X and NMVOC respectively (see Table 2.4), for reasons refer to Section 2.4). Based on the final 2010 emission data, Denmark reported exceeding its emission ceilings for both pollutants, NMVOC and NH_3, in addition to the aforementioned Member States. This differs compared to the previous submission where the Danish provisional 2010 emissions data indicated NMVOC and NH_3 emissions were below the level of the ceilings.

Table 2.3 Overview of Member State final 2010 and provisional 2011 emission data submitted under the NECD and emission ceilings for 2010

Member State	NO_x final emission data 2010 (Gg)	NO_x provisional emission data 2011 (Gg)	NO_x ceilings	Emissions ceiling comparison (2010/2011)		NMVOC final emission data 2010 (Gg)	NMVOC provisional emission data 2011 (Gg)	NMVOC ceilings	Emissions ceiling comparison (2010/2011)		SO_2 final emission data 2010 (Gg)	SO_2 provisional emission data 2011 (Gg)	SO_2 ceilings	Emissions ceiling comparison (2010/2011)		NH_3 final emission data 2010 (Gg)	NH_3 provisional emission data 2011 (Gg)	NH_3 ceilings	Emissions ceiling comparison (2010/2011)		Emission estimates from mobile sources based on
Austria	147.5	144.2	103	×	×	131.8	126.2	159	✓	✓	18.8	18.5	39	✓	✓	62.9	62.1	66	✓	✓	fuel used
Belgium	220.7	210.1	176	×	×	107.0	100.5	139	✓	✓	64.0	55.7	99	✓	✓	67.7	67.4	74	✓	✓	fuel used
Bulgaria	116.9	115.8	247	✓	✓	93.1	94.6	175	✓	✓	387.2	388.1	836	✓	✓	50.8	49.1	108	✓	✓	fuel sold
Cyprus	18.0	20.8	23	✓	✓	11.7	9.6	14	✓	✓	22.1	21.1	39	✓	✓	5.5	5.1	9	✓	✓	fuel sold
Czech Republic	239.1	225.3	286	✓	✓	150.9	145.8	220	✓	✓	170.3	170.7	265	✓	✓	68.6	65.7	80	✓	✓	fuel sold
Denmark	133.5	125.5	127	×	✓	86.1	79.5	85	×	✓	14.8	13.9	55	✓	✓	69.3	68.5	69	×	✓	fuel sold
Estonia	36.7	35.6	60	✓	✓	35.0	33.1	49	✓	✓	83.2	72.7	100	✓	✓	10.3	10.4	29	✓	✓	fuel sold
Finland	166.2	155.4	170	✓	✓	116.5	108.8	130	✓	✓	66.8	57.3	110	✓	✓	37.5	37.3	31	×	×	fuel sold
France	1 075.3	1 005.0	810	×	×	805.2	733.9	1 050	✓	✓	287.5	254.6	375	✓	✓	648.9	674.0	780	✓	✓	fuel sold
Germany	1 331.9	1 292.9	1 051	×	×	1 056.6	1 008.1	995	×	×	444.1	444.7	520	✓	✓	552.0	563.4	550	×	×	fuel sold
Greece	318.8	295.5	344	✓	✓	184.6	158.4	261	✓	✓	265.2	261.9	523	✓	✓	64.4	61.6	73	✓	✓	fuel sold
Hungary	162.5	129.2	198	✓	✓	108.6	100.5	137	✓	✓	32.3	34.9	500	✓	✓	65.4	64.8	90	✓	✓	fuel sold
Ireland	75.4	67.6	65	×	×	44.5	43.1	55	✓	✓	26.2	23.4	42	✓	✓	107.5	108.6	116	✓	✓	fuel used
Italy	963.6	936.6	990	✓	✓	1 080.3	1 032.0	1 159	✓	✓	210.2	211.2	475	✓	✓	379.0	387.6	419	✓	✓	fuel sold
Latvia	34.3	32.0	61	✓	✓	66.1	70.0	136	✓	✓	3.3	3.2	101	✓	✓	17.4	12.9	44	✓	✓	fuel sold
Lithuania	54.8	50.5	110	✓	✓	68.9	68.8	92	✓	✓	33.1	35.5	145	✓	✓	30.0	29.3	84	✓	✓	fuel sold
Luxembourg	17.9	18.0	11	×	×	8.5	8.9	9	✓	✓	2.2	1.7	4	✓	✓	4.6	4.6	7	✓	✓	fuel used
Malta	8.1	7.9	8	×	✓	2.5	3.0	12	✓	✓	8.1	7.9	9	✓	✓	1.5	1.6	3	✓	✓	fuel sold
Netherlands	274.1	259.4	260	×	✓	145.2	144.4	185	✓	✓	34.0	33.6	50	✓	✓	121.9	118.7	128	✓	✓	fuel used
Poland	863.4	850.7	879	✓	✓	653.7	652.0	800	✓	✓	950.4	910.0	1 397	✓	✓	271.1	270.5	468	✓	✓	fuel sold
Portugal	185.6	175.8	250	✓	✓	176.3	177.2	180	✓	✓	53.5	46.5	160	✓	✓	47.2	46.8	90	✓	✓	fuel sold
Romania	217.9	221.4	437	✓	✓	365.4	354.5	523	✓	✓	350.4	331.1	918	✓	✓	159.8	159.2	210	✓	✓	fuel sold
Slovakia	88.6	85.0	130	✓	✓	62.4	68.3	140	✓	✓	69.4	68.5	110	✓	✓	24.9	24.2	39	✓	✓	fuel sold
Slovenia	44.7	44.4	45	✓	✓	34.6	29.9	40	✓	✓	9.8	10.9	27	✓	✓	17.4	16.8	20	✓	✓	fuel sold
Spain	901.1	934.1	847	×	×	619.7	597.6	662	✓	✓	448.7	499.3	746	✓	✓	388.8	380.7	353	×	×	fuel sold
Sweden	153.4	145.5	148	×	✓	182.8	177.2	241	✓	✓	31.6	29.6	67	✓	✓	51.7	51.7	57	✓	✓	fuel sold
United Kingdom	1 106.6	1 033.1	1 167	✓	✓	771.4	752.1	1 200	✓	✓	406.9	378.8	585	✓	✓	285.7	290.1	297	✓	✓	fuel used
EU-27	**8 957**	**8 618**	**9 003**	✓	✓	**7 169**	**6 878**	**8 848**	✓	✓	**4 494**	**4 385**	**8 297**	✓	✓	**3 612**	**3 633**	**4 294**	✓	✓	

Notes: '✓' indicates that the final (2010) or provisional (2011) emission data reported by a Member State meet or lie below its respective emission ceiling.
'×' indicates that a ceiling is not met.

Table 2.4 Comparison of provisional 2010 emission data (submitted in 2011) and final 2010 emission data (submitted in the latest 2012 reporting round)

Member State	NO_x			NMVOC			SO_2			NH_3		
	Are 2010 provisional data below the ceiling?	Are 2010 final data below the ceiling?	Change between provisional and final data (in %)	Are 2010 provisional data below the ceiling?	Are 2010 final data below the ceiling?	Change between provisional and final data (in %)	Are 2010 provisional data below the ceiling?	Are 2010 final data below the ceiling?	Change between provisional and final data (in %)	Are 2010 provisional data below the ceiling?	Are 2010 final data below the ceiling?	Change between provisional and final data (in %)
Austria	No	No	2.4 %	Yes	Yes	0.1 %	Yes	Yes	0.5 %	Yes	Yes	1.2 %
Belgium	No	No	0.0 %	Yes	Yes	2.0 %	Yes	Yes	– 4.8 %	Yes	Yes	– 2.0 %
Bulgaria	Yes	Yes	– 2.9 %	Yes	Yes	0.1 %	Yes	Yes	0.0 %	Yes	Yes	0.2 %
Cyprus	Yes	Yes	0.2 %	Yes	Yes	2.9 %	Yes	Yes	– 0.1 %	Yes	Yes	2.7 %
Czech Republic	Yes	Yes	0.1 %	Yes	Yes	– 2.0 %	Yes	Yes	0.5 %	Yes	Yes	– 0.2 %
Denmark	No	No	3.7 %	Yes	No	2.2 %	Yes	Yes	6.2 %	Yes	No	0.6 %
Estonia	Yes	Yes	0.1 %	Yes	Yes	– 7.9 %	Yes	Yes	0.0 %	Yes	Yes	0.0 %
Finland	No	Yes	– 3.2 %	Yes	Yes	– 0.1 %	Yes	Yes	– 2.3 %	No	No	1.1 %
France	No	No	– 0.5 %	Yes	Yes	– 5.5 %	Yes	Yes	9.9 %	Yes	Yes	0.6 %
Germany	No	No	0.7 %	No	No	0.3 %	Yes	Yes	– 1.2 %	Yes	No	0.8 %
Greece	Yes	Yes	1.1 %	Yes	Yes	0.6 %	Yes	Yes	– 0.2 %	Yes	Yes	– 0.3 %
Hungary	Yes	Yes	0.0 %	Yes	Yes	0.0 %	Yes	Yes	0.0 %	Yes	Yes	0.0 %
Ireland	No	No	3.8 %	Yes	Yes	0.6 %	Yes	Yes	1.2 %	Yes	Yes	1.3 %
Italy	Yes	Yes	– 0.2 %	Yes	Yes	– 2.0 %	Yes	Yes	0.0 %	Yes	Yes	0.0 %
Latvia	Yes	Yes	– 2.8 %	Yes	Yes	1.7 %	Yes	Yes	– 55.4 %	Yes	Yes	0.2 %
Lithuania	Yes	Yes	– 5.2 %	Yes	Yes	– 0.1 %	Yes	Yes	– 13.1 %	Yes	Yes	0.0 %
Luxembourg	No	No	– 13.1 %	Yes	Yes	– 3.6 %	Yes	Yes	30.6 %	Yes	Yes	14.3 %
Malta	No	No	0.0 %	Yes	Yes	0.0 %	Yes	Yes	0.0 %	Yes	Yes	0.0 %
Netherlands	No	No	– 0.6 %	Yes	Yes	– 3.5 %	Yes	Yes	0.3 %	Yes	Yes	0.1 %
Poland	Yes	Yes	– 0.4 %	Yes	Yes	– 1.2 %	Yes	Yes	– 2.4 %	Yes	Yes	0.0 %
Portugal	Yes	Yes	3.0 %	Yes	Yes	4.2 %	Yes	Yes	– 21.0 %	Yes	Yes	– 1.6 %
Romania	Yes	Yes	– 19.9 %	Yes	Yes	– 17.1 %	Yes	Yes	– 5.8 %	Yes	Yes	– 0.7 %
Slovakia	Yes	Yes	0.1 %	Yes	Yes	0.0 %	Yes	Yes	0.0 %	Yes	Yes	2.0 %
Slovenia	Yes	Yes	0.1 %	Yes	Yes	2.9 %	Yes	Yes	– 5.5 %	Yes	Yes	0.3 %
Spain	No	No	0.1 %	No	Yes	– 7.8 %	Yes	Yes	1.1 %	No	No	5.5 %
Sweden	No	No	– 4.9 %	Yes	Yes	– 7.2 %	Yes	Yes	– 8.3 %	Yes	Yes	0.1 %
United Kingdom	Yes	Yes	0.1 %	Yes	Yes	– 2.2 %	Yes	Yes	0.1 %	Yes	Yes	0.5 %
EU-27 [a]	**No**	**Yes**	**– 0.7 %**	**Yes**	**Yes**	**– 3.1 %**	**Yes**	**Yes**	**– 1.1 %**	**Yes**	**Yes**	**0.9 %**

Note: Negative percentage values means that emission data of the latest 2012 submission are lower than the provisional data reported in 2011.

([a]) The comparison of the data with the EU-27 ceilings refers to the aggregated NECD Annex I emission ceiling.

2.3 Progress of non-EU countries in meeting 2010 emission ceilings under the Gothenburg Protocol to the UNECE LRTAP Convention

Three non-EU EEA member countries (Liechtenstein, Norway and Switzerland) have emissions ceilings for 2010 and onwards specified under the Gothenburg Protocol of the LRTAP Convention Long-range Transboundary Air Pollution (UNECE, 1979). Data reported by these countries show that Liechtenstein and Norway have missed their NO_X and NH_3 emissions ceilings, while Switzerland exceeded only its NH_3 ceiling in 2010, but achieved all ceilings in 2011 (Table 2.5).

2.4 Analysis of emissions per pollutant

Figures 2.2, 2.3, 2.4, and 2.5 illustrate the relative difference ([8]) between final 2010 and provisional 2011emissions and the emission ceilings. Where percentage values are positive, it indicates that emissions were above the emission ceiling.

2.4.1 NO_X emissions

The largest emitters of NO_X in 2011 were Germany, the United Kingdom, and France. Between 2010 and 2011, 23 of 27 Member States reported emission reductions. The total reduction for the EU-27 between 2010 and 2011 amounts to – 3.8 %. The highest absolute reductions between 2010 and 2011 occurred in the United Kingdom and France.

Provisional 2011 NO_X emission data show seven Member States (Austria, Belgium, France, Germany, Ireland, Luxembourg and Spain) did not achieve their ceilings in the year 2011. Eleven Member States exceeded their respective NO_X ceilings for 2010 (Austria, Belgium, Denmark, France, Germany, Ireland, Luxembourg, Malta, Netherlands, Spain and Sweden).

Provisional 2010 emission data (submitted in 2011) indicated that Finland did not achieve its NO_X emission ceiling. However, the recently-submitted final 2010 emission data now indicate that Finnish NO_X emissions are below its ceiling. The reported exceedance indicated by the provisional 2010 data was due to an error since corrected following recalculation and further cross-checking ([9]).

The aggregated provisional 2011 emission data for NO_X in the EU-27 lie between the Annex I and the more stricter Annex II emission ceiling.

Table 2.5 Progress by other EEA member countries in meeting the emission ceilings set in the UNECE LRTAP Convention Gothenburg Protocol

Country	NO_X final emission data 2010 (Gg)	NO_X provisional emission data 2011 (Gg)	NO_X ceilings	Emissions ceiling comparison (2010/2011)		NMVOC final emission data 2010 (Gg)	NMVOC provisional emission data 2011 (Gg)	NMVOC ceilings	Emissions ceiling comparison (2010/2011)		SO_2 final emission data 2010 (Gg)	SO_2 provisional emission data 2011 (Gg)	SO_2 ceilings	Emissions ceiling comparison (2010/2011)		NH_3 final emission data 2010 (Gg)	NH_3 provisional emission data 2011 (Gg)	NH_3 ceilings	Emissions ceiling comparison (2010/2011)	
Liechtenstein	0.63	0.65	0.37	×	×	0.41	0.41	0.86	✓	✓	0.03	0.03	0.11	✓	✓	0.17	0.17	0.15	×	×
Norway	185	178	156	×	×	142	138	195	✓	✓	19	19	22	✓	✓	27	26	23	×	×
Switzerland	78	74	79	✓	✓	89	86	144	✓	✓	12	10	26	✓	✓	63	63	63	×	✓

Note: '✓' indicates that the final (2010) or provisional (2011) emission data reported by a country meet or lie below its respective emission ceiling.

'×' indicates that a ceiling is not met.

Emission data for Liechtenstein, Norway and Switzerland are the latest reported data under the LRTAP Convention and are compared with the respective emission ceilings of the Gothenburg Protocol. Liechtenstein has signed but not yet ratified the protocol. Neither Iceland nor Turkey has yet signed the Gothenburg Protocol.

([8]) The relative difference between emissions in 2011 and the emission ceilings was estimated as 100 x (E_{2011} – $E_{ceiling}$)/$E_{ceiling}$ (%), where E_{2011} and $E_{ceiling}$ are the 2011 emissions and the 2010 emission ceiling value.

([9]) Source: Personal communication with Finnish emission inventory authority, and IIR of Finland, 2013.

2.4.2 NMVOC emissions

The largest emitters of NMVOC in 2011 were Italy, Germany, and the United Kingdom. Between 2010 and 2011, 21 Member States reported emission reductions. The total reduction for the EU-27 between 2010 and 2011 amounts to – 4.1 %. The highest absolute reductions between 2010 and 2011 occurred in France, Germany and Italy.

Based on the final 2010 emission data, Denmark and Germany both exceeded their emissions ceilings for NMVOC. This is a change to the last submission (in December 2011) where the Danish provisional 2010 data was below the NMVOC emission ceiling (see Table 2.4). For 2011, the provisional NMVOC 2011 emission data of 26 Member States were below their respective ceilings (see Figure 2.3). Only Germany did not achieve its ceiling in the year 2011. The provisional 2011 emission data are only marginally above their emission ceiling (1.3 %). The emissions of Germany have generally declined over time and were actually below the ceiling in the year 2009 (see Appendix 1, Table A1.2). The increase of emissions in Germany between 2009 and 2010 might be linked to economic recovery. Between 2010 and 2011, Germany's NMVOC emission have declined again (– 4.6 %, see Appendix 1, Table A1.2).

Spain's provisional 2010 emission data (submitted 2011) showed that Spain would not comply with its NMVOC emission ceiling (Table 2.4). But with the submission in 2012, the final 2010 emission data and the provisional 2011 data show, that Spain's NMVOC emissions are well below its ceiling. Several revisions led to this reported difference in NMVOC emissions:

- a revision of emission factors in the 'Solvents and Other Product Use' sector (subsector Paint Application and Other Activities with Solvents Use): the *EMEP/EEA air pollutant emission inventory guidebook* (EMEP/EEA, 2009) emission factors have been complemented with national emission factors obtained from a national survey;
- changed activity data for the textile industry;
- changed activity data from refineries and the consideration of the installation of a vapour recovery system;
- in the sector road transport a revision of the emission factors due to the use of the updated version 7.1 and version 9.0 of COPERT IV emission model, the incorporation of EURO V emission factors and a correction of the date when Euro V entered into force, and a revision of the age distribution of the vehicle fleet (IIR of Spain, 2013).

The aggregated provisional 2011 NMVOC emission data in the EU-27 are lower than the respective EU-27 ceilings (Annex I and Annex II emission ceilings).

2.4.3 SO_2 emissions

The largest emitters of SO_2 in 2011 were Poland, Spain and Germany. Between 2010 and 2011, 19 Member States reported emission reductions. The total reduction for the EU-27 between 2010 and 2011 amounts to – 2.4 %. The highest absolute reductions between 2010 and 2011 occurred in Poland, France and the United Kingdom.

Final 2010 and provisional 2011 SO_2 emission data of all Member States were below their respective ceilings (Figure 2.4).

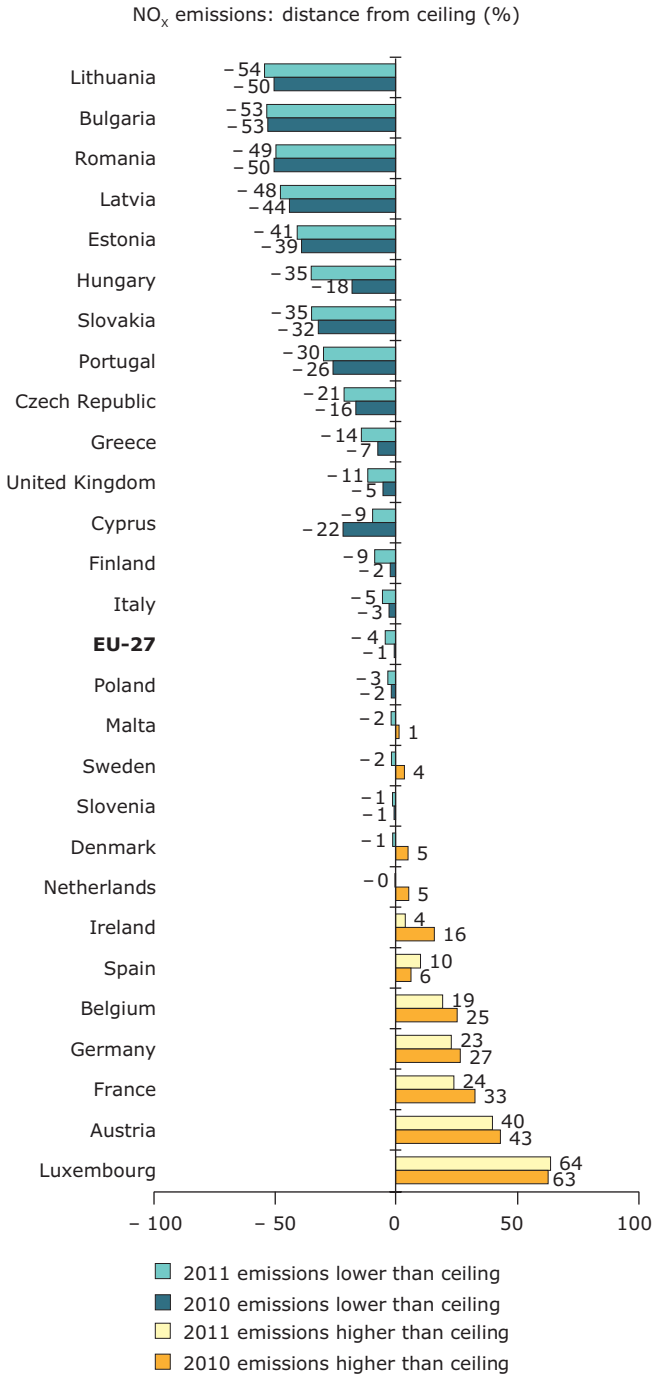
2.4.4 NH_3 emissions

The largest emitters of NH_3 in 2011 were France, Germany and Italy. Between 2010 and 2011, 19 of 27 Member States reported emission reductions. The total change for the EU-27 between 2010 and 2011 amounts to +0.6 %. The highest absolute reductions between 2010 and 2011 occurred in Spain and Latvia.

Final 2010 emission data shows Denmark, Finland, Germany and Spain reported emission higher than the respective emissions ceilings. Provisional NH_3 emission data of 24 Member States in the year 2011 were below their respective ceilings (Figure 2.5). Three Member States (Finland, Germany and Spain) did not achieve their ceilings in the year 2011; emissions from these countries show a rather stable emission trend over the years, with no or limited reductions.

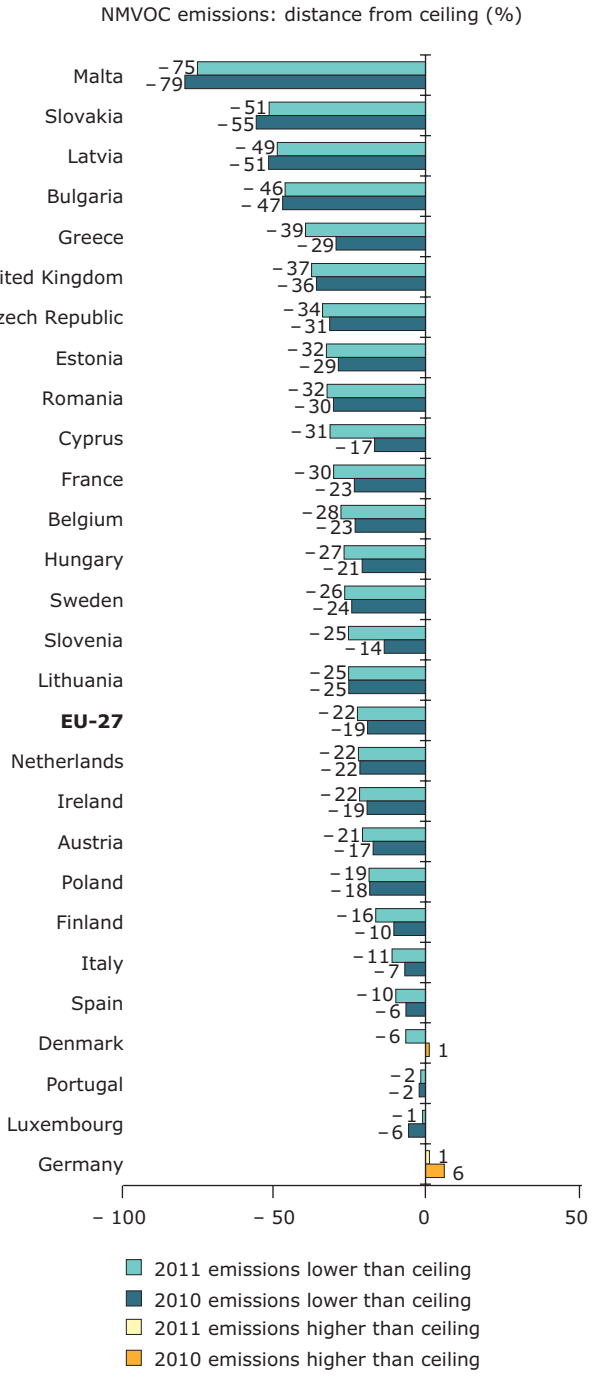
In Finland, NH_3 emission calculation methods have been improved since setting the national ceiling for NH_3 under the UNECE CLRTAP (UNECE, 1979) and EU NECD (EC, 2001). The Finnish ammonia emission inventory has been updated during 2011–2012 according to new information on sources of ammonia emissions and related emission rates. The updated estimates are based on improved calculation methods for the agriculture sector, as well as updated information on emissions from

Figure 2.2 Distance from ceiling (%) for NO_x emissions in 2010 and 2011



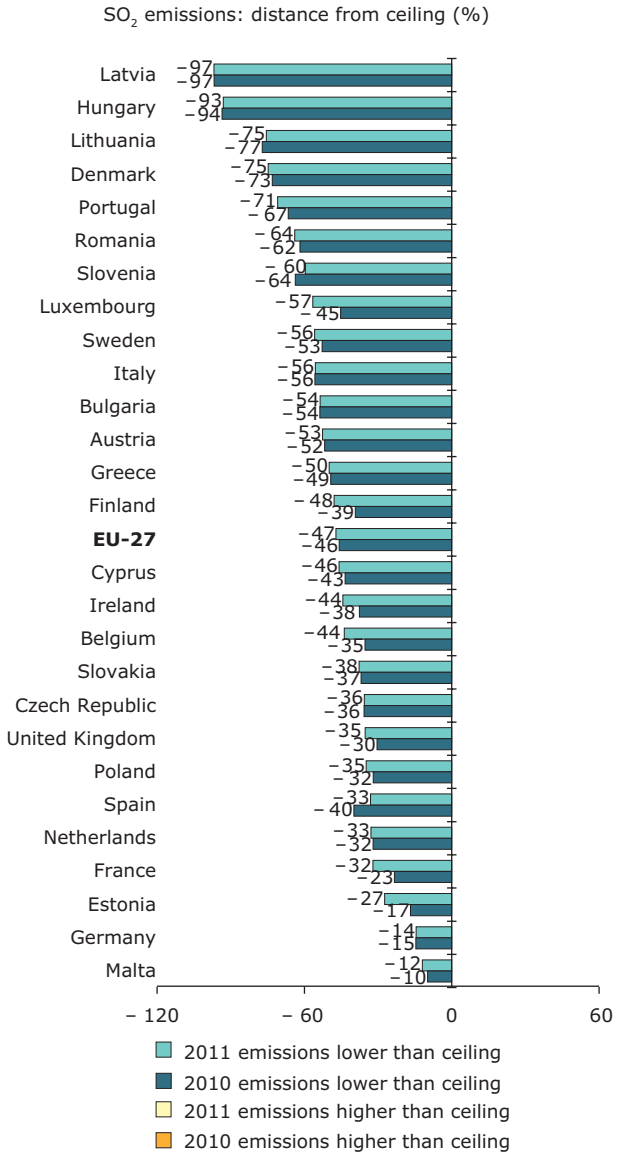
Note: The reported national totals of Austria, Belgium, Ireland, Luxembourg, the Netherlands and the United Kingdom are based on fuel used. All other Member States reported a national total based on fuel sold. The aggregated EU-27 emission total is a mix of data based on fuel used and fuel sold.

Figure 2.3 Distance from ceiling (%) for NMVOC emissions in 2010 and 2011



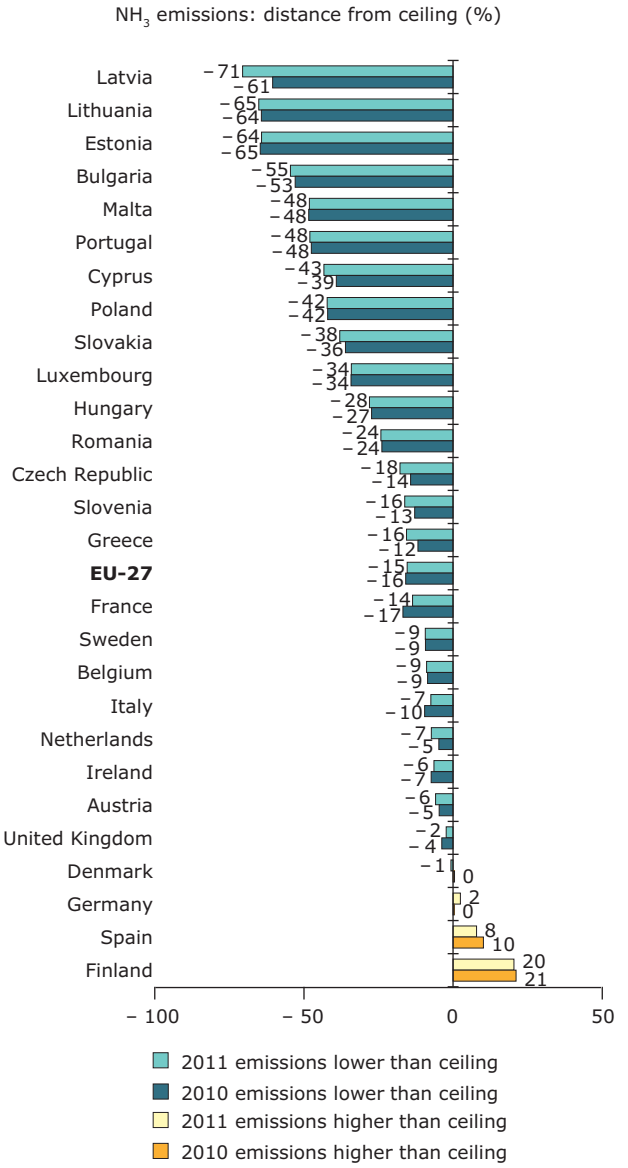
Note: The national totals of Austria, Belgium, Ireland, Luxembourg, the Netherlands and the United Kingdom are based on fuel used. All other Member States reported a national total based on fuel sold. The aggregated EU-27 emission total is a mix of data based on fuel used and fuel sold.

Figure 2.4 Distance from ceiling (%) for SO_2 emissions in 2010 and 2011



Note: The national totals of Austria, Belgium, Ireland, Luxembourg, the Netherlands and the United Kingdom are based on fuel used. All other Member States reported a national total based on fuel sold. The aggregated EU-27 emission total is a mix of data based on fuel used and fuel sold.

Figure 2.5 Distance from ceiling (%) for NH_3 emissions in 2010 and 2011



Note: The reported national totals of Austria, Belgium, Ireland, Luxembourg, the Netherlands and the United Kingdom are based on fuel used. All other Member States reported a national total based on fuel sold. The aggregated EU-27 emission total is a mix of data based on fuel used and fuel sold.

other sectors which were excluded from the earlier estimates. In the recalculated inventory the factors affecting emissions were adjusted for the time series 1990–2010 to reflect the actual changes in emissions. As a result, the emission trend in the updated inventory is lower for the years 1990–1997 and slightly higher for the years after 1997 than in the earlier inventory. Ammonia emissions are projected to decrease to 35 kilotonnes in the next coming years, but then slowly increase to 37 kt by 2050 (IIR of Finland, 2013).

Germany's provisional 2010 emission data (submitted 2011) was below the NH_3 ceiling (Table 2.4). But with the submission in 2012, the final 2010 emission data and the provisional 2011 data show, that Germany's NH_3 emissions are slightly above its ceiling (Table 2.3). This is due to a change of the animal counting method in the official survey by Statistisches Bundesamt (Federal Statistical Agency). 'Female cattle for slaughtering' are now considered to be part of the inventory category 'suckler cows' rather than 'heifers', leading to an emission increase of about 60 % NH_3 per animal place and year. Further, a slight increase of emissions resulted from methodological modifications leading to a more complete accounting of NH_3 emissions from spreading and from skin particles and hair. These increases in NH_3 emissions outweigh other effects like a steadily increasing share of slurry being anaerobically digested and the annually increasing numbers air scrubbing systems in pig husbandry which were not accounted for in the last submission (IIR of Germany, 2013).

Spain has also revised its estimation of NH_3 emissions upwards following an in-depth revision of parameters related to bovines and synthetic fertilizers application.

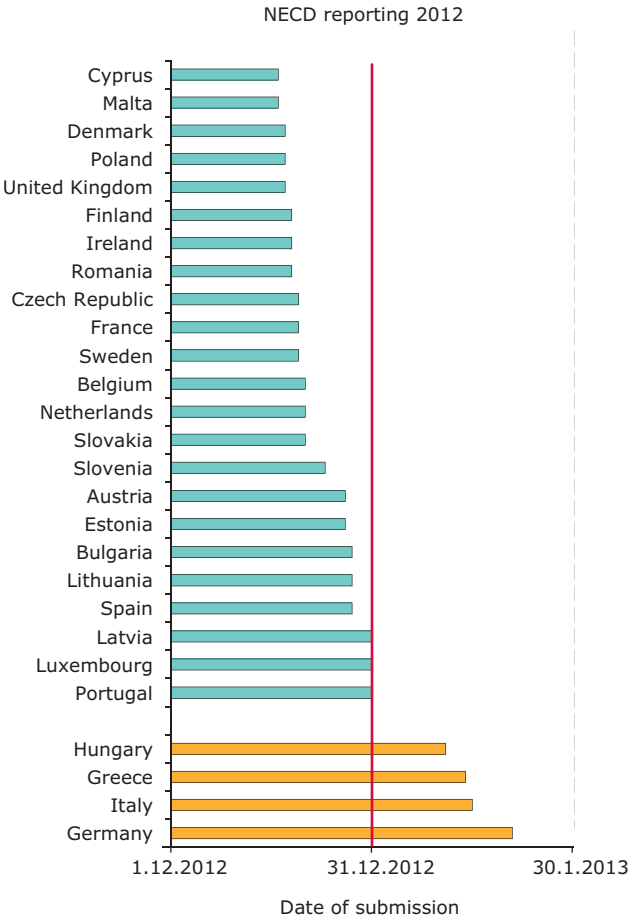
2.5 Timeliness and transparency of reporting

Information in this section is based on submissions from Member States delivered to the EEA via the Eionet ReportNet Central Data Repository (CDR), submissions delivered directly to the Commission and explanatory information provided by Member States directly to ETC/ACM.

Timeliness and completeness: In the 2012 reporting cycle ([10]), all Member States provided the mandatory information on final 2010 emissions and the provisional 2011 emission data. Four Member States submitted these data after the formal deadline for submission: Hungary, Greece, Italy and Germany (Figure 2.6).

A compilation of data from all Member States is required in order to allow comparison with the respective EU-27 ceilings as defined in Annexes I and II to the NECD. It is therefore extremely important that Member States report complete emission data sets.

Figure 2.6 Reporting status — date of first NECD inventory submission to CDR or European Commission



([10]) The reporting deadline for the 2012 reporting cycle was 31 December 2012.

Transparency of submitted information: Providing inventory reports or explanatory information that describe the methods and sources of the reported data is not mandatory under the NECD, meaning that the transparency of submitted information is rather limited. Nevertheless, ten Member States (Austria, Finland, Germany, Latvia, the Netherlands, Poland, Romania, Slovakia, Spain and Sweden) voluntarily submitted an inventory report together with their NECD inventories ([11]).

More detailed information about the quality of the 2012 NECD submissions (for example, in terms of its internal consistency and completeness) will be provided in the annual joint EEA and EMEP/CEIP inventory review report (EMEP/EEA, 2013).

2.6 Basis for estimating emissions from mobile sources

In preparing emission inventories and projections under the NECD, Member States should apply the principles outlined in the UNECE guidelines for reporting emission data under the LRTAP Convention (UNECE, 2009). These guidelines specify how emissions from transport should be reported (paragraph 15): 'For emissions from transport, Parties within the EMEP region should calculate and report emissions consistent with national energy balances reported to Eurostat or the International Energy Agency. Emissions from road vehicle transport should therefore be calculated and reported **on the basis of the fuel sold in the Party concerned. (…) In addition** ([12]), Parties may report emissions from road vehicles based on fuel used or kilometres driven in the geographic area of the Party. The method for the estimate(s) should be clearly specified in the IIR (informative inventory report)'.

In paragraph 16 of the guidelines, the basis for compliance checking is detailed: 'For Parties within the EMEP region for which emission ceilings are derived from national energy projections based on the amount of fuels sold, compliance checking will be based on the reporting on the basis of fuels sold in the geographic area of the Party. Other Parties within the EMEP region (Austria, Belgium, Ireland, Lithuania, Luxemburg, the Netherlands, Switzerland and United Kingdom) may choose to use the national emission total calculated on the basis of fuels used in the geographic area of the Party as a basis for compliance.'

The difference between transport emissions estimated using the amount of fuel sold within a country and emissions estimated using the amount of fuel consumed in a country can be significant for countries where 'tank tourism' occurs, i.e. where fuel purchased within a country is actually used outside the country and vice versa. This can therefore lead to omissions or double counting at the EU level.

The sum of EU-27 emissions is based on a mix of emissions reported by Member States based upon fuel used (6 Member States) and fuel sold (21 Member States) data. Table 2.6 gives an overview of the reporting by the Member States. The 'Method used' column lists the different models used by Member States in order to provide an indication of consistency for the calculation of emissions from road transport.

2.7 Potential underestimation of Member State emissions due to non-reporting of emissions from certain sectors

2.7.1 Objectives

The official reporting guidelines of the LRTAP Convention (UNECE, 2009) (and through Annex III to the NECD, by extension applicable also to reporting under the NECD) allow countries to report emissions as 'NE' for those sectors where emissions are known to occur but have not been estimated or reported.

Countries should separately report the reasons why emissions are not estimated. The *EMEP/EEA air pollutant emission inventory guidebook* (EMEP/EEA, 2009) recommends the following points concerning 'NE' emissions as elements to be included in an informative inventory report:

- a list of sources not estimated in the inventory;
- a qualitative assessment of their importance, currently and in future;
- a description of intentions to calculate these in future or an explanation of why there are no such plans.

([11]) For comparison, 19 Member States submitted Informative Inventory Reports (IIRs) under the LRTAP Convention by 15 March 2013 (EEA 2013d).
([12]) Emphasis added.

Table 2.6 Basis for estimating emissions from mobile sources (years 2010 and 2011)

Member State	Road transport		Other transport sectors	Two national totals reported
	fuel used/fuel sold	method used	fuel used/fuel sold	Yes/No
Austria (*)	fuel used	GLOBEMI ([a])	n/a	Yes
Belgium (*)	fuel used	Flanders: MIMOSA ([b]) - EF of COPERT IV, v9.1 ([c]); Wallonia: COPERT IV, v9.1; Brussels Capital Region: COPERT IV, v8.1	fuel used	No
Bulgaria	fuel sold	COPERT IV, v10	n/a	No
Cyprus	fuel sold	COPERT IV, v9.0	n/a	No
Czech Republic	fuel sold	Country-specific model	n/a	No (2010 Yes)
Denmark	fuel sold	COPERT IV	fuel sold	No
Estonia	fuel sold	COPERT IV, v9.1	fuel sold	No
Finland	fuel sold	LIISA ([d]), sub-model of LIPASTO ([e])	fuel sold	No
France	fuel sold	COPERT IV, v9.0	1A3ai(i), 1A3aii(i), 1A3aii(ii), 1A4ci, 1A4cii: fuel used; 1A3ai(ii), 1A3c, 1A3di(i), 1A3dii, 1A4ciii: fuel sold	No
Germany	fuel sold	TREMOD, v5.2 ([f])	fuel sold	No
Greece	fuel sold	COPERT IV, v8.1	n/a	No
Hungary	fuel sold	COPERT IV, v9.0	n/a	No
Ireland (*)	fuel used	COPERT IV, v9.1	n/a	Yes
Italy	fuel sold	COPERT IV, v9	fuel sold	No
Latvia	fuel sold	COPERT IV	1A3ai(i), 1A3ai(ii), 1A3aii(i), 1A3aii(ii), 1A3c, 1A3di(i), 1A3di(ii), 1A3dii: fuel used; 1A4ci, 1A4cii, 1A4ciii, 1A5b: fuel sold	No
Lithuania (*)	fuel sold	COPERT IV, v9.0	1A3aii(i), 1A3aii(ii), 1A3c, 1A4ci, 1A4cii, 1A5b: fuel used; 1A3ai(i), 1A3ai(ii), 1A3di(i), 1A3dii, 1A4ciii: fuel sold	No
Luxembourg (*)	fuel used	GLOBEMI	fuel sold	Yes
Malta	fuel sold	Country-specific model	1A3di(i), 1A3dii: fuel used; 1A3ai(i), 1A3ai(ii), 1A3aii(ii), 1A4ci, 1A4ciii: fuel sold	No
Netherlands (*)	fuel used	VERSIT+ ([g])	n/a	Yes
Poland	fuel sold	National approach	1A3c: fuel used; 1A3ai(i), 1A3ai(ii), 1A3aii(i), 1A3aii(ii), 1A3di(i), 1A3di(ii), 1A3dii, 1A4ci, 1A4cii, 1A4ciii: fuel sold	No
Portugal	fuel sold	COPERT IV, v9.0	n/a	No
Romania	fuel sold	COPERT IV	fuel sold	No
Slovakia	fuel sold	COPERT IV, v9.0	fuel sold	No
Slovenia	fuel sold	COPERT IV, v6.1	fuel sold	No
Spain	fuel sold	COPERT IV, v9.0	1A3ai(i), 1A3aii(i), 1A3dii (Diesel oil), 1A4ci (Diesel oil), 1A4cii, 1A4ciii: fuel used; 1A3c, 1A3dii (Residual oil), 1A4ci (Fuels other than diesel oil): fuel sold	No
Sweden	fuel sold	HBEFA 3.1 ([h])	n/a	No
United Kingdom (*)	fuel used	Country-specific model; NO_x: COPERT IV, v8.1	n/a	No

Notes: (*) indicates that these countries may additionally report national emission totals calculated on the basis of fuels used in the geographic area of the Party as a basis for compliance.

([a]) Global emission model (Hausberger, 1998).

([b]) Road emission model (Lewyckyj et al., 2004).

([c]) Computer Programme to Calculate Emissions from Road Transportation (EMEP/EEA, 2009).

([d]) Road traffic exhaust emissions calculation software (Mäkelä et al., 2002, VTT, 2013a).

([e]) Calculation system for traffic exhaust emissions and energy consumption in Finland (VTT, 2013b).

([f]) Transport Emission Estimation Model (Knörr et al., 2009).

([g]) 'VERSIT' refers to 'verkeerssituatie', 'traffic situation' in Dutch (Smit et al., 2006, 2007).

([h]) The Handbook Emission Factors for Road Transport (INFRAS, 2013).

In the previous NECD status report (EEA, 2012), a simple assessment was made of the underestimation in national emission inventories that may occur due to the use of the notation key 'NE' by Member States. This analysis was repeated (slightly improved) again in this year's assessment (Table 2.7; see also Figure 2.7). The main intention of the analysis is to encourage Member States to review source categories reported as 'NE' and in future provide estimates, especially where these sources may add significantly to the currently reported national totals.

A separate analysis was also performed in order to assess the number of Member States that report emissions from NO_X and NMVOC from the agriculture sector, source-pollutant combinations that were not included in the original modelling undertaken to support the determination of the 2010 emissions ceilings.

2.7.2 Assessment of potential underestimated emissions

In assessing the importance of source categories reported as 'NE', for each NFR source category the mean emissions (excluding Member States reporting 'NE' for the respective category) for a given year are calculated. In a next step, the share (in percentage terms) of the mean emissions of each category to the mean National Total (i.e. the aggregated total of the mean emissions of each category) is calculated. Source categories reported as 'NE' in national inventories were then assumed to contribute as much to the national total of the Member State as the share made by the same source category. In a final step, the potential underestimated emissions arising from use of the 'NE' notation key were added to the 2010 and 2011 national totals of the Member States, and compared with the ceilings within the NECD to determine whether the difference in emissions is likely to affect the number of Member States attaining their ceilings.

The method to quantify potential underestimates was slightly modified this year (no grouping of Member States and 'NE' excluded from the mean of each source category). The method is recognised as being a simple tool, but nevertheless does provide an initial indication of situations where underestimations might have occurred, and which can then be investigated in more detail.

2.7.3 Assessment results

Certain Member States used the notation key 'NE' for a considerable number of source categories (Figure 2.7 and Table 2.7). Ireland, for example, reported 40 source categories of NH_3 to be 'NE'. In contrast, 10 Member States used 'NE' only for up to 10 source categories (sum of all four pollutants) or for no source category at all in the case of Austria and Cyprus.

Twenty of the 25 Member States that made use of the notation key 'NE' provided reasons for using it in their data submissions under the NECD, and it should be noted that Member States might provide more information under their LRTAP Convention submissions. The information made available, however, varied somewhat in its informative value.

Table 2.7 also shows, for the sources reported as 'NE', the estimated underestimation of these sources as a percentage of the original reported national total. Generally, the potential underestimation is low for all pollutants. There are only a few cases where the potential underestimation is above 10 % (NO_X in Bulgaria, NMVOC in Bulgaria and Lithuania).

For most Member States, the addition of the potential underestimate to their national totals does not change the evaluation if a Member State has emissions above or below the emission ceilings. However, for certain Member States the addition of the potential underestimate increases the 2011 emissions above the level of the respective 2010 ceiling. These Member States are:

- Denmark (for NO_X and NH_3),
- the Netherlands (NO_X),
- Portugal (NMVOC),
- Slovenia (NO_X).

The same analysis was done to assess the possible underestimation of the final 2010 emission data (results not shown). For two Member States, the addition of the potential underestimate to their national totals of the year 2010 increases the 2010 emissions above the level of the respective 2010 ceiling:

- Portugal (NMVOC),
- Slovenia (NO_X).

Table 2.7 'Not-estimated' source categories and their contribution to total emissions

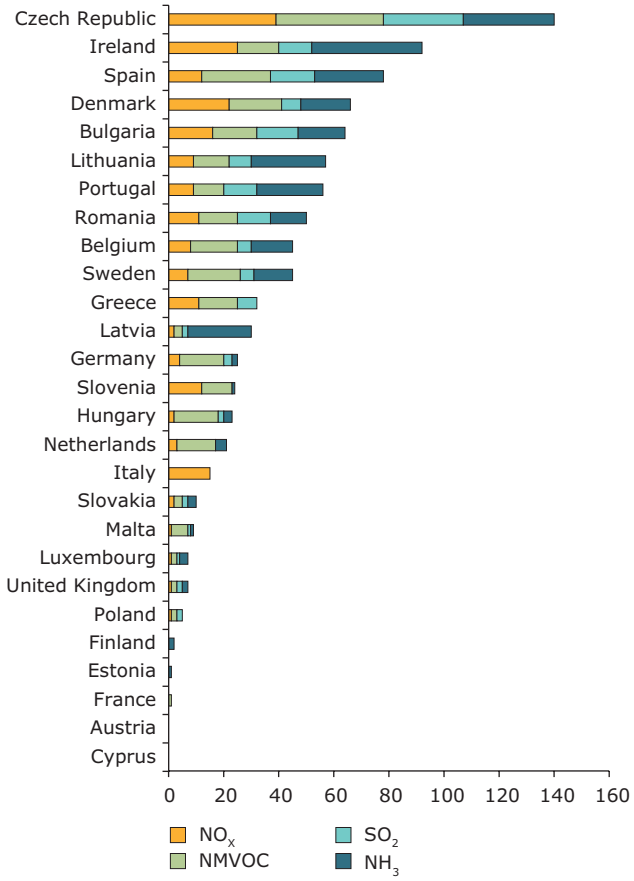
Member State	NO_x				NMVOC				SO_2				NH_3			
	Number of source categories NE	Potential underestimation of emissions (%)	Are 2011 emissions lower than ceiling?	Are 2011 emissions + potential underesti-mation lower than ceiling?	Number of source categories NE	Potential underestimation of emissions (%)	Are 2011 emissions lower than ceiling?	Are 2011 emissions + potential underestimation lower than ceiling?	Number of source categories NE	Potential underestimation of emissions (%)	Are 2011 emissions lower than ceiling?	Are 2011 emissions + potential underestimation lower than ceiling?	Number of source categories NE	Potential underestimation of emissions (%)	Are 2011 emissions lower than ceiling?	Are 2011 emissions + potential underestimation lower than ceiling?
Austria	0	0 %	No	No	0	0 %	Yes	Yes	0	0 %	Yes	Yes	0	0 %	Yes	Yes
Belgium	8	3 %	No	No	17	2 %	Yes	Yes	5	1 %	Yes	Yes	15	1 %	Yes	Yes
Bulgaria	16	12 %	Yes	Yes	16	16 %	Yes	Yes	15	1 %	Yes	Yes	17	4 %	Yes	Yes
Cyprus	0	0 %	Yes	Yes	0	0 %	Yes	Yes	0	0 %	Yes	Yes	0	0 %	Yes	Yes
Czech Republic	**39**	4 %	Yes	Yes	**39**	8 %	Yes	Yes	**29**	5 %	Yes	Yes	**33**	5 %	Yes	Yes
Denmark	22	3 %	Yes	No	19	3 %	Yes	Yes	7	2 %	Yes	Yes	18	2 %	Yes	No
Estonia	0	0 %	Yes	Yes	0	0 %	Yes	Yes	0	0 %	Yes	Yes	1	0 %	Yes	Yes
Finland	0	0 %	Yes	Yes	0	0 %	Yes	Yes	0	0 %	Yes	Yes	2	0 %	No	No
France	0	0 %	No	No	1	0 %	Yes	Yes	0	0 %	Yes	Yes	0	0 %	Yes	Yes
Germany	4	0 %	No	No	16	2 %	No	No	3	0 %	Yes	Yes	2	1 %	No	No
Greece	11	1 %	Yes	Yes	14	5 %	Yes	Yes	7	1 %	Yes	Yes	0	0 %	Yes	Yes
Hungary	2	0 %	Yes	Yes	16	2 %	Yes	Yes	2	0 %	Yes	Yes	3	0 %	Yes	Yes
Ireland	**25**	3 %	No	No	**15**	9 %	Yes	Yes	12	4 %	Yes	Yes	**40**	6 %	Yes	Yes
Italy	15	2 %	Yes	Yes	0	0 %	Yes	Yes	0	0 %	Yes	Yes	0	0 %	Yes	Yes
Latvia	2	0 %	Yes	Yes	3	3 %	Yes	Yes	2	0 %	Yes	Yes	23	1 %	Yes	Yes
Lithuania	9	1 %	Yes	Yes	13	19 %	Yes	Yes	8	1 %	Yes	Yes	27	7 %	Yes	Yes
Luxembourg	1	0 %	No	No	2	0 %	Yes	Yes	1	0 %	Yes	Yes	3	1 %	Yes	Yes
Malta	1	0 %	Yes	Yes	6	10 %	Yes	Yes	1	0 %	Yes	Yes	1	0 %	Yes	Yes
Netherlands	3	1 %	Yes	No	**14**	1 %	Yes	Yes	0	0 %	Yes	Yes	4	2 %	Yes	Yes
Poland	1	0 %	Yes	Yes	2	1 %	Yes	Yes	2	4 %	Yes	Yes	0	0 %	Yes	Yes
Portugal	9	0 %	Yes	Yes	11	3 %	Yes	No	12	0 %	Yes	Yes	**24**	2 %	Yes	Yes
Romania	11	2 %	Yes	Yes	14	3 %	Yes	Yes	12	2 %	Yes	Yes	13	2 %	Yes	Yes
Slovakia	2	1 %	Yes	Yes	3	0 %	Yes	Yes	2	0 %	Yes	Yes	3	0 %	Yes	Yes
Slovenia	12	2 %	Yes	No	11	1 %	Yes	Yes	0	0 %	Yes	Yes	1	0 %	Yes	Yes
Spain	12	0 %	No	No	25	2 %	Yes	Yes	16	0 %	Yes	Yes	25	8 %	No	No
Sweden	7	0 %	Yes	Yes	19	2 %	Yes	Yes	5	0 %	Yes	Yes	14	2 %	Yes	Yes
United Kingdom	1	0 %	Yes	Yes	2	1 %	Yes	Yes	2	0 %	Yes	Yes	2	0 %	Yes	Yes

Note: To enable comparison between Member States, the analysis is based on converted NFR tables for Italy. The number of source categories that were not estimated could vary slightly from the number originally reported by Italy as presented in the table above.

Bold numbers: Number of the notation key 'NE' increased by more than five compared with the submissions of 2011.

For Ireland and Luxembourg, due to the lack of data based on fuel used for road vehicle transport, data of these categories are based on fuel sold for the calculation of the underestimation.

Figure 2.7 Number of Member State 'not estimated' source categories for NO_x, NMVOC, SO_2 and NH_3



2.7.4 *Assessment of Member State reporting for 'new' source categories*

Since the original integrated assessment modelling undertaken to support the determination of the 2010 emissions ceilings, improved knowledge has become available on the sources of air pollutants. In several instances, 'new' emission sources for the pollutants covered within the scope of the NECD have been recognised; on the basis of subsequent measurements, emission factors have been developed that now enable emission estimates to be made.

As a result, several (but not all) Member States now report emissions from 'new' pollutant–source category combinations that were not included in the original modelling. Examples of such combinations are NO_x and NMVOC emissions from the agriculture sector (NFR code 4).

The *EMEP/EEA air pollutant emission inventory guidebook* (EMEP/EEA, 2009) provides Member States with default methodologies and emission factors that they can use in order to estimate emissions. Not all 'new' pollutant–source combinations have a default method with default emission factors defined in the guidebook. This occurs, for example, when scientific evidence is deemed insufficient to recommend an emission factor suitable for use across Europe. Nevertheless, in a number of Member States, national methods and data are available that have been applied to estimate emissions for these combinations.

A study was therefore performed to assess the number of Member States that report emissions from selected 'new' sources (NO_x and NMVOC from the agriculture sector), and to determine the significance of these emissions with respect to the reported national totals and national emissions ceilings. Emissions from the agriculture sector were listed by pollutant, Member State and category. The share of emissions relative to the Member States' ceilings and national totals were calculated (see also Table 2.8 and Table 2.9). The NO_x and NMVOC emissions from all Member States and categories of the agriculture sector were also summed and compared with the total EU-27 emissions of the years 2010 and 2011 (Table 2.10). Detailed results of the analyses undertaken are provided in Appendix 4.

NO_x emissions from the agriculture sector (Table 2.8 and Appendix 4): Data for NO_x from the agriculture sector were reported by 17 Member States for the year 2011, although nine of these countries reported data only for one of the agriculture source categories. Germany, Hungary, Austria and Cyprus submitted data for the highest number of categories (11 to 15). In 2011, NO_x emissions in the agriculture sector corresponded to 11 %, 6 % and 5 % of the emission ceilings in Germany, Hungary and Austria respectively. The share of national total NO_x emissions that was attributed to agricultural activities was 10 % and 9 % for Hungary and Germany respectively. In other Member States, NO_x emissions from agriculture accounted for a relatively small share (below 4 %) of total NO_x emissions in 2011 (Table 2.8).

NMVOC emissions from the agriculture sector (Table 2.9 and Appendix 4): Data for NMVOC in the agriculture sector were reported by 17 Member States, ten of which reported data only for one of the agriculture source categories. Cyprus, Italy, Estonia and Romania submitted data for the highest number of categories (7 to 10). In 2011, NMVOC

Table 2.8 Share of NO_x emissions from the agriculture sector to Member States' national total and ceilings in 2011

Member State	Share of NO_x emissions of the National Total	Share of NO_x emissions of the emission ceiling	Number of categories, where values were reported
Hungary	10 %	6 %	14
Germany	9 %	11 %	15
Austria	4 %	5 %	12
Bulgaria	3 %	< 3 %	1
Estonia	3 %	< 3 %	9
Netherlands	< 3 %	< 3 %	8
Spain	< 3 %	< 3 %	2
Luxembourg	< 3 %	< 3 %	1
Poland	< 3 %	< 3 %	1
Cyprus	< 1 %	< 1 %	11
Portugal	< 1 %	< 1 %	1
Greece	< 1 %	< 1 %	1
Romania	< 1 %	< 1 %	8
France	< 1 %	< 1 %	1
Denmark	< 1 %	< 1 %	1
Italy	< 1 %	< 1 %	1
Latvia	< 1 %	< 1 %	1

Table 2.9 Share of NMVOC emissions from the agriculture sector to Member States' national total and ceilings in 2011

Member State	Share of NMVOC emissions of the national total	Share of NMVOC emissions of the emission ceiling	Number of categories, where values were reported
Bulgaria	34 %	19 %	2
Cyprus	24 %	16 %	10
Romania	18 %	12 %	7
Estonia	11 %	7 %	8
Spain	9 %	8 %	1
Luxembourg	< 3 %	< 3 %	1
Austria	< 3 %	< 3 %	2
Portugal	< 3 %	< 3 %	1
Slovakia	< 1 %	< 1 %	1
France	< 1 %	< 1 %	1
Denmark	< 1 %	< 1 %	1
Netherlands	< 1 %	< 1 %	1
Italy	< 1 %	< 1 %	9
Poland	< 1 %	< 1 %	2
Finland	< 1 %	< 1 %	1
Latvia	0 %	0 %	1
Ireland	0 %	0 %	1

Table 2.10 Effect on NO_x and NMVOC emissions of the 'new' emission source category 'agriculture' on EU total emissions

in Gg	NO_x		NMVOC	
	2010	2011	2010	2011
EU-27 emissions as reported	8 957	8 618	7 169	6 878
Amount of the agriculture sector	171	180	169	168
EU-27 without emissions from the agriculture sector	**8 786**	**8 438**	**7 000**	**6 710**
Annex I emission ceiling	9 003	9 003	8 848	8 848
Annex II emission ceiling	8 180	8 180	7 585	7 585

emissions in the agriculture sector often made up a notable fraction of the respective emission ceiling in some of the Member States (Bulgaria (19 %), Cyprus (16 %) and Romania (12 %). For the Member States reporting NMVOC emissions from this sector, the emissions reported are sometimes very significant compared to their national totals: Bulgaria (34 %), Cyprus (24 %), Romania (18 %), Estonia (11 %) and Spain (9 %). In other Member States, NMVOC emissions from agriculture formed only a relatively small share (below 3 %) of total NMVOC emissions in 2011.

At the EU level, the subtraction of NO_x and NMVOC emissions from the 'agriculture' sector has only a minor impact (Table 2.10). These emissions amount in 2011 to 2.1 % and 2.4 % of the total emissions of NO_x and NMVOC respectively, and for NO_x their subtraction would not bring the EU emissions below the level of the Annex II NO_x ceiling.

3 Conclusions

This chapter summarises the overall emission trends in the Member States, problems encountered during the compilation of the inventory submissions and suggestions for improvements.

3.1 Emission trends and ceiling assessments

Emission trends
The NECD does not require Member States to report emission time-series data back to 1990. Between 2010 and 2011, emission reductions were reported by over three-quarters of the Member States for NO_X and NMVOC, and by more than two-thirds of the Member States for SO_2 and NH_3. A more complete picture of past emission trends in the European Union will be provided by mid-2013 when the EEA publishes its annual European Union emission inventory report under the UNECE LRTAP Convention (EEA, 2013a).

Comparison of final 2010 emission estimates and ceilings
Twelve Member States reported emission data above the ceiling of at least one pollutant based on the final 2010 data. The final emission data exceed the respective ceilings for three of the four pollutants in Germany and Denmark (NO_X, NMVOC and NH_3), and for two pollutants in Spain (NO_X and NH_3).

Comparison of provisional 2011 emission estimates and ceilings
Eight Member States reported emission data above the ceiling of at least one pollutant. The provisional 2011 emission data exceed the respective ceilings for three of the four pollutants in Germany (NO_X, NMVOC and NH_3), and for two pollutants in Spain (NO_X and NH_3).

Based on the provisional 2011 emissions data, the highest number of ceiling exceedances was reported for NO_X (seven Member States). One Member State reported provisional 2011 emission data for NMVOC above the ceiling, and three countries reported exceedances of NH_3. All Member States continue to meet their SO_2 ceilings.

A number of Member States used the notation key 'NE' to indicate that emissions from specific source categories were not estimated. In general, the potential underestimation occurring as a result of this (in percentage terms) is low for all pollutants. There are however a few cases where the potential underestimation is more than 10 % (NO_X: Bulgaria, NMVOC: Bulgaria and Lithuania). For Denmark (NO_X and NH_3), the Netherlands (NO_X), Portugal (NMVOC) and Slovenia (NO_X), the potential underestimation may increase the 2011 emissions to levels above the respective 2010 ceiling. Member States are encouraged to review and limit their use of 'NE' when reporting emission data in future, and to provide numerical estimates where relevant and applicable.

3.2 Outlook post-2011

The NECD requires that emission ceilings have to be met by 2010 and shall not be exceeded in any year following. It is noted that a number of Member States have reported emissions for 2011 which lie just below the value of their respective ceilings, e.g. the Netherlands, Denmark, Slovenia, Sweden and Malta for NO_X, Luxembourg and Portugal for NMVOC, and Denmark for NH_3. It is important that all Member States take appropriate measures to limit any increase in emissions which would result in their ceilings being exceeded.

3.3 Recommended improvements in reporting methodology

It is important that the completeness of Member States' reporting improves in accordance with the reporting criteria of the EMEP reporting guidelines. Classifying specific emission source categories as 'NE' should be limited only to insignificant sources of emissions, in accordance with the definitions included in the reporting guidelines. It is a cause of concern that for some Member States the estimation of the incomplete emissions may lead to emission levels above emission ceilings. The reporting of the best performing Member States might be used to establish a benchmark to encourage Member States concerned to further improve their reporting completeness over the next few years.

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Appendix 1 Emission data submitted under the NEC Directive

The tables (Table A1.1, Table A1.2, Table A1.3 and Table A1.4) below show, for each pollutant, a comparison ([13]) between 2011 emissions and those reported for the years 1990 and 2010 (if data were reported). The national totals of the Member States are either emission estimates based on fuel used or fuel sold for mobile sources. An overview is given in Table 2.3 and Table 2.6 of the main report.

Table A1.1 NO_x data reported by Member States

NO_x (Gg)	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	NECD emission ceilings	Change 2010–2011 (%)	Change 1990–2011 (%)	Contribution to EU-27 in 2011 (%)
Austria	182	163	163	169	168	164	159	147	148	144	103	– 2.2	– 20.6	1.7
Belgium	401	NE	326	292	274	264	239	208	221	210	176	– 4.8	– 47.7	2.4
Bulgaria	NE	NE	NE	NE	NE	NE	NE	NE	117	116	247	– 0.9	NE	1.3
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	18	21	23	15.6	NE	0.2
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	239	225	286	– 5.8	NE	2.6
Denmark	278	271	205	186	188	174	156	137	134	126	127	– 6.0	– 54.9	1.5
Estonia	74	39	38	37	35	39	36	30	37	36	60	– 3.0	– 51.6	0.4
Finland	323	279	201	169	188	187	168	155	166	155	170	– 6.5	– 51.9	1.8
France	1 842	1 705	1 582	1 410	1 338	1 271	1 180	1 099	1 075	1 005	810	– 6.5	– 45.4	11.7
Germany	2 875	2 175	1 924	1 575	1 561	1 483	1 406	1 307	1 332	1 293	1 051	– 2.9	– 55.0	15.0
Greece	NE	NE	NE	NE	NE	NE	NE	NE	319	295	344	– 7.3	NE	3.4
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	162	129	198	– 20.5	NE	1.5
Ireland	128	122	122	121	116	112	104	83	75	68	65	– 10.3	– 47.2	0.8
Italy	NE	NE	NE	NE	NE	NE	NE	NE	964	937	990	– 2.8	NE	10.9
Latvia	65	39	36	37	38	38	34	32	34	32	61	– 6.6	– 50.8	0.4
Lithuania	NE	NE	NE	NE	NE	NE	NE	NE	55	51	110	– 7.8	NE	0.6
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	18	18	11	0.6	NE	0.2
Malta	NE	NE	8.4	9.3	9.3	9.2	9.0	9.0	8.1	7.9	8	– 3.2	NE	0.1
Netherlands	566	472	394	337	324	309	300	277	274	259	260	– 5.4	– 54.2	3.0
Poland	NE	NE	862	860	891	868	830	791	863	851	879	– 1.5	NE	9.9
Portugal	226	257	259	259	238	232	209	197	186	176	250	– 5.3	– 22.3	2.0
Romania	NE	NE	NE	NE	NE	NE	NE	NE	218	221	437	1.6	NE	2.6
Slovakia	NE	NE	NE	NE	NE	NE	NE	NE	89	85	130	– 4.0	NE	1.0
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	45	44	45	– 0.6	NE	0.5
Spain	1 215	1 256	1 277	1 310	1 264	1 257	1 074	965	901	934	847	3.7	– 23.1	10.8
Sweden	269	246	209	178	175	169	161	151	153	145	148	– 5.2	– 45.9	1.7
United Kingdom	NE	NE	NE	NE	1 518	1 453	1 315	1 145	1 107	1 033	1 167	– 6.6	NE	12.0
EU-27	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**8 957**	**8 618**	**9 003**	**– 3.8**	**NE**	**100**

Note: 'NE' denotes 'not estimated or not provided'.

([13]) Changes of emissions in each country during 2010 and 2011 are expressed as 100 x (E_{curr} – E_{prev})/E_{prev} (%), where E_{curr} and E_{prev} are current and previous total emissions in each year. Changes of emissions in each country from 1990 to 2011 are expressed as 100 x (E_{curr} – E_{1990})/E_{1990} (%), where E_{curr} and E_{1990} are current and 1990 total emissions in each year.

Table A1.2 NMVOC data reported by Member States

NMVOC (Gg)	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	NECD emission ceilings	Change 2010–2011 (%)	Change 1990–2011 (%)	Contribution to EU-27 in 2011 (%)
Austria	273	224	176	159	170	157	149	120	132	126	159	– 4.2	– 53.8	1.8
Belgium	314	NE	186	145	140	129	120	107	107	101	139	– 6.0	– 68.0	1.5
Bulgaria	NE	NE	NE	NE	NE	NE	NE	NE	93	95	175	1.6	NE	1.4
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	12	10	14	– 17.6	NE	0.1
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	151	146	220	– 3.4	NE	2.1
Denmark	162	165	137	112	107	102	97	90	86	80	85	– 7.6	– 51.1	1.2
Estonia	70	50	45	40	38	39	37	35	35	33	49	– 5.5	– 52.8	0.5
Finland	239	203	168	136	131	129	118	111	117	109	130	– 6.6	– 54.4	1.6
France	2 602	2 174	1 723	1 231	1 118	997	912	816	805	734	1 050	– 8.9	– 71.8	10.7
Germany	3 132	1 809	1 395	1 147	1 135	1 072	1 018	931	1 057	1 008	995	– 4.6	– 67.8	14.7
Greece	NE	NE	NE	NE	NE	NE	NE	NE	185	158	261	– 14.2	NE	2.3
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	109	100	137	– 7.5	NE	1.5
Ireland	88	79	66	54	53	51	49	47	44	43	55	– 3.1	– 51.2	0.6
Italy	NE	NE	NE	NE	NE	NE	NE	NE	1 080	1 032	1 159	– 4.5	NE	15.0
Latvia	102	67	65	73	74	83	74	61	66	70	136	5.8	– 31.1	1.0
Lithuania	NE	NE	NE	NE	NE	NE	NE	NE	69	69	92	0.0	NE	1.0
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	8.5	8.9	9	4.8	NE	0.1
Malta	NE	NE	3.1	3.3	3.5	3.3	3.0	2.6	2.5	3.0	12	19.4	NE	0.0
Netherlands	477	338	233	169	160	157	155	146	145	144	185	– 0.6	– 69.8	2.1
Poland	NE	NE	574	572	630	611	634	615	654	652	800	– 0.3	NE	9.5
Portugal	289	278	255	206	199	193	186	174	176	177	180	0.6	– 38.6	2.6
Romania	NE	NE	NE	NE	NE	NE	NE	NE	365	355	523	– 3.0	NE	5.2
Slovakia	NE	NE	NE	NE	NE	NE	NE	NE	62	68	140	9.4	NE	1.0
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	35	30	40	– 13.5	NE	0.4
Spain	1 043	966	988	788	764	747	685	622	620	598	662	– 3.6	– 42.7	8.7
Sweden	359	278	224	198	195	192	189	184	183	177	241	– 3.1	– 50.7	2.6
United Kingdom	NE	NE	NE	NE	1 002	973	886	799	771	752	1 200	– 2.5	NE	10.9
EU-27	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**7 169**	**6 878**	**8 848**	**– 4.1**	**NE**	**100**

Note: 'NE' denotes 'not estimated or not provided'.

Table A1.3 SO_2 data reported by Member States

SO_2 (Gg)	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	NECD emission ceilings	Change 2010–2011 (%)	Change 1990–2011 (%)	Contribution to EU-27 in 2011 (%)
Austria	74	47	31	27	28	24	22	18	19	18	39	– 1.8	– 74.9	0.4
Belgium	363	NE	174	145	135	126	98	77	64	56	99	– 13.0	– 84.7	1.3
Bulgaria	NE	NE	NE	NE	NE	NE	NE	NE	387	388	836	0.2	NE	8.9
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	22	21	39	– 4.4	NE	0.5
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	170	171	265	0.2	NE	3.9
Denmark	178	140	31	24	28	26	20	15	15	14	55	– 6.1	– 92.2	0.3
Estonia	274	116	97	76	70	88	69	55	83	73	100	– 12.7	– 73.4	1.7
Finland	263	99	79	69	84	83	70	59	67	57	110	– 14.2	– 78.2	1.3
France	1 302	968	630	463	436	425	360	311	287	255	375	– 11.5	– 80.4	5.8
Germany	5 292	1 718	653	477	487	469	469	419	444	445	520	0.1	– 91.6	10.1
Greece	NE	NE	NE	NE	NE	NE	NE	NE	265	262	523	– 1.2	NE	6.0
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	32	35	500	8.0	NE	0.8
Ireland	183	161	139	71	61	55	46	32	26	23	42	– 10.7	– 87.2	0.5
Italy	NE	NE	NE	NE	NE	NE	NE	NE	210	211	475	0.5	NE	4.8
Latvia	105	49	16	6.6	6.1	5.7	4.8	4.2	3.3	3.2	101	– 1.3	– 96.9	0.1
Lithuania	NE	NE	NE	NE	NE	NE	NE	NE	33	36	145	7.4	NE	0.8
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	2.2	1.7	4	– 20.7	NE	0.0
Malta	NE	NE	24	11	11	12	11	8.0	8.1	7.9	9	– 2.4	NE	0.2
Netherlands	192	130	73	64	64	61	51	38	34	34	50	– 1.3	– 82.5	0.8
Poland	NE	NE	1 445	1 233	1 311	1 223	1 001	867	950	910	1 397	– 4.2	NE	20.8
Portugal	160	170	124	86	79	79	74	57	53	47	160	– 13.0	– 70.9	1.1
Romania	NE	NE	NE	NE	NE	NE	NE	NE	350	331	918	– 5.5	NE	7.5
Slovakia	NE	NE	NE	NE	NE	NE	NE	NE	69	68	110	– 1.3	NE	1.6
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	10	11	27	11.2	NE	0.2
Spain	2 105	1 741	1 476	1 285	1 177	1 166	523	477	449	499	746	11.3	– 76.3	11.4
Sweden	105	69	42	36	36	32	30	29	32	30	67	– 6.4	– 71.8	0.7
United Kingdom	NE	NE	NE	NE	650	568	489	395	407	379	585	– 6.9	NE	8.6
EU-27	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**4 494**	**4 385**	**8 297**	**– 2.4**	**NE**	**100**

Note: 'NE' denotes 'not estimated or not provided'.

Table A1.4 NH_3 data reported by Member States

NH_3 (Gg)	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	NECD emission ceilings	Change 2010–2011 (%)	Change 1990–2011 (%)	Contribution to EU-27 in 2011 (%)
Austria	65	71	65	62	62	63	62	63	63	62	66	– 1.3	– 5.0	1.7
Belgium	120	NE	86	71	71	68	67	67	68	67	74	– 0.4	– 43.9	1.9
Bulgaria	NE	NE	NE	NE	NE	NE	NE	NE	51	49	108	– 3.3	NE	1.4
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	5.5	5.1	9	– 6.9	NE	0.1
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	69	66	80	– 4.2	NE	1.8
Denmark	98	87	83	76	74	73	72	69	69	69	69	– 1.2	– 30.3	1.9
Estonia	25	11	10	10	10	10	11	10	10	10	29	1.2	– 57.8	0.3
Finland	39	36	36	38	38	38	38	37	38	37	31	– 0.6	– 3.7	1.0
France	682	661	700	657	654	654	674	659	649	674	780	3.9	– 1.2	18.6
Germany	706	605	608	579	575	572	572	579	552	563	550	2.1	– 20.2	15.5
Greece	NE	NE	NE	NE	NE	NE	NE	NE	64	62	73	– 4.3	NE	1.7
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	65	65	90	– 0.9	NE	1.8
Ireland	107	112	113	110	110	107	108	109	107	109	116	1.0	1.3	3.0
Italy	NE	NE	NE	NE	NE	NE	NE	NE	379	388	419	2.3	NE	10.7
Latvia	48	16	13	16	16	16	16	17	17	13	44	– 25.5	– 73.2	0.4
Lithuania	NE	NE	NE	NE	NE	NE	NE	NE	30	29	84	– 2.4	NE	0.8
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	4.6	4.6	7	0.2	NE	0.1
Malta	NE	NE	1.8	1.6	1.6	1.7	1.5	1.5	1.5	1.6	3	0.4	NE	0.0
Netherlands	355	208	161	141	141	140	127	125	122	119	128	– 2.6	– 66.6	3.3
Poland	NE	NE	280	270	285	289	285	273	271	270	468	– 0.2	NE	7.4
Portugal	64	59	61	50	48	49	47	47	47	47	90	– 0.9	– 26.4	1.3
Romania	NE	NE	NE	NE	NE	NE	NE	NE	160	159	210	– 0.4	NE	4.4
Slovakia	NE	NE	NE	NE	NE	NE	NE	NE	25	24	39	– 3.0	NE	0.7
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	17	17	20	– 3.8	NE	0.5
Spain	333	315	397	376	394	398	366	376	389	381	353	– 2.1	14.4	10.5
Sweden	55	64	59	56	55	53	52	50	52	52	57	– 0.1	– 5.9	1.4
United Kingdom	NE	NE	NE	NE	303	292	279	281	286	290	297	1.6	NE	8.0
EU-27	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**3 612**	**3 633**	**4 294**	**0.6**	**NE**	**100**

Note: 'NE' denotes 'not estimated or not provided'.

Appendix 2 Data sources

An overview of the emission data sources used for the tables Table A1.1, Table A1.2, Table A1.3 and Table A1.4, as of 9 April 2013.

Table A2.1 Inventory submissions

Member State	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011
Austria	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Belgium	SUBM12		SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Bulgaria									SUBM12	SUBM12
Cyprus									SUBM12	SUBM12
Czech Republic									SUBM12	SUBM12
Denmark	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Estonia	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Finland	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
France	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Germany	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Greece									SUBM12	SUBM12
Hungary									SUBM12	SUBM12
Ireland	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Italy									SUBM12	SUBM12
Latvia	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Lithuania									SUBM12	SUBM12
Luxembourg									SUBM12	SUBM12
Malta			SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Netherlands	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Poland			SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Portugal	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Romania									SUBM12	SUBM12
Slovakia									SUBM12	SUBM12
Slovenia									SUBM12	SUBM12
Spain	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
Sweden	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12
United Kingdom					SUBM12	SUBM12	SUBM12	SUBM12	SUBM12	SUBM12

Note: SUBM12 = inventory submission with the reporting deadline of 31 December 2012.

Appendix 3 Reporting status of NECD emissions

The status of reporting NECD emissions (2012 reporting round) as of 9 April 2013 is shown in Table A3.1 below.

Table A3.1 Submission overview

Member State	Submission		Resub-missions	Years covered	Format	NO_x, NMVOC, SO_2, NH_3		Projections table	Updated NECD programmes	Socio-economic data (Table 2B)	IIR
	uploaded to CDR	to the EC				2010 final	2011 provisional				
Austria	27.12.2012	n/a	n/a	1990–2011	NFR 2009-1	x	x	np	n/a	n/a	27.12.2012, 31.01.2013
Belgium	21.12.2012	n/a	04.02.2013	1990, 2000, 2005–2011	NFR 2009-1	x	x	2015, 2020	n/a	n/a	np
Bulgaria	28.12.2012	n/a	n/a	2010–2011	NFR 2009-1	x	x	2010, 2015, 2020	n/a	n/a	np
Cyprus	17.12.2012	n/a	n/a	2010–2011	NFR 2009-1	x	x	np	n/a	n/a	np
Czech Republic	20.12.2012	n/a	n/a	2010–2011	NFR 2009-1	x	x	2010	n/a	n/a	np
Denmark	18.12.2012	n/a	n/a	1980–2011	NFR 2009-1	x	x	2010, 2015, 2020, 2030	n/a	n/a	np
Estonia	27.12.2012	n/a	n/a	1990–2011	NFR 2009-1	x	x	2015, 2020	n/a	n/a	np
Finland	19.12.2012	n/a	19.03.2013	1980–2011	NFR 2009-1	x	x	2020, 2030 (NH_3), 2050	n/a	x	19.12.2012
France	20.12.2012	n/a	n/a	1980–2011	NFR 2009-1	x	x	2010	n/a	n/a	np
Germany	21.01.2013	n/a	n/a	1990–2011	NFR 2009-1	x	x	np	n/a	n/a	21.01.2013
Greece	14.01.2013	n/a	n/a	2010–2011	NFR 2009-1	x	x	np	n/a	n/a	np
Hungary	11.01.2013	n/a	14.01.2013	2010–2011	NFR 2009-1	x	x	np	n/a	n/a	np
Ireland	19.12.2012	n/a	n/a	1990–2011	NFR 2009-1	x	x	np	n/a	n/a	np
Italy	15.01.2013	n/a	16.01.2013, 18.01.2013	2010–2011	NFR 2008-1	x	x	np	n/a	n/a	np
Latvia	31.12.2012	n/a	27.03.2013	1990–2011	NFR 2009-1	x	x	np	n/a	n/a	31.12.2012, 27.03.2013
Lithuania	28.12.2012	n/a	n/a	2010–2011	NFR 2009-1	x	x	2010, 2015, 2020	n/a	x	np
Luxembourg	31.12.2012	n/a	n/a	2010–2011	NFR 2009-1	x	x	np	n/a	n/a	np
Malta	17.12.2012	n/a	n/a	2000–2011	NFR 2009-1	x	x	np	n/a	n/a	np
Netherlands	21.12.2012	n/a	15.02.2013	1990–2011	NFR 2009-1	x	x	2010, 2020, 2030	n/a	n/a	15.03.2013
Poland	18.12.2012	n/a	28.03.2013, 03.04.2013	2000–2011	NFR 2009-1	x	x	2010	n/a	x	18.12.2012, 28.03.2013
Portugal	31.12.2012	n/a	n/a	1990–2011	NFR 2009-1	x	x	np	n/a	n/a	np
Romania	19.12.2012	n/a	n/a	2010–2011	NFR 2009-1	x	x	np	n/a	n/a	19.12.2012
Slovakia	21.12.2012	n/a	27.03.2013	2010–2011	NFR 2009-1	x	x	2010, 2015, 2020, 2030, 2050	n/a	x	21.12.2012
Slovenia	24.12.2012	n/a	n/a	2010–2011	NFR 2009-1	x	x	2015, 2020, 2030	n/a	x	np
Spain	28.12.2012	n/a	n/a	1990–2011	NFR 2009-1	x	x	np	n/a	n/a	28.12.2012
Sweden	20.12.2012	n/a	29.01.2013	1990–2011	NFR 2009-1	x	x	2010, 2015, 2020, 2030	n/a	n/a	20.12.2012
United Kingdom	18.12.2012	n/a	n/a	2006–2011	NFR 2009-1	x	x	np	n/a	n/a	np

Note: 'np' denotes 'not provided'.

'x' denotes 'provided'.

'NFR' denotes 'nomenclature for reporting' — the sectoral classification system developed by UNECE/EMEP for reporting air emissions.

Values in red indicate data were not received by the reporting deadline of 31 December 2012.

Appendix 4 Member State reporting of NO_x and NMVOC emissions from the agriculture sector

Table A4.1 NO_x emissions from the agriculture sector

	NO_x Agriculture	2010 emissions	2011 emissions	% of ceiling (2011)	% of National Total (2011)	Number of countries that reported values	Number of countries that reported 'IE'	Number of countries that used other entries	Emission factor in EMEP/EEA GB available	Method in EMEP/EEA GB available
4 B 1 a	Cattle dairy					7	0	20	no	yes
	Austria	1.499	1.501	1.46 %	1.04 %					
	Germany	0.660	0.653	0.06 %	0.05 %					
	Netherlands	0.661	0.728	0.28 %	0.28 %					
	Cyprus	0.006	0.006	0.02 %	0.03 %					
	Estonia	0.008	0.008	0.01 %	0.02 %					
	Hungary	0.058	0.059	0.03 %	0.05 %					
	Romania	0.145	0.142	0.03 %	0.06 %					
4 B 1 b	Cattle non-dairy					7	0	20	no	yes
	Austria	1.955	1.912	1.86 %	1.33 %					
	Germany	0.769	0.742	0.07 %	0.06 %					
	Netherlands	1.110	1.044	0.40 %	0.40 %					
	Cyprus	0.004	0.005	0.02 %	0.02 %					
	Estonia	0.004	0.004	0.01 %	0.01 %					
	Hungary	0.065	0.063	0.03 %	0.05 %					
	Romania	0.044	0.045	0.01 %	0.02 %					
4 B 13	Other					3	0	24	no	yes
	Austria	0.010	0.010	0.010 %	0.007 %					
	Netherlands	0.026	0.027	0.01 %	0.01 %					
	Hungary	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
4 B 2	Buffalo					2	0	25	no	yes
	Germany	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Hungary	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
4 B 3	Sheep					6	1	20	no	yes
	Austria	0.075	0.076	0.07 %	0.05 %					
	Germany	0.039	0.031	0.003 %	0.00 %					
	Cyprus	0.002	0.002	0.01 %	0.009 %					
	Estonia	< 0.001	< 0.001	< 0.001 %	0.001 %					
	Hungary	0.007	0.006	0.003 %	0.005 %					
	Romania	0.042	0.043	0.01 %	0.02 %					
4 B 4	Goats					6	1	20	no	yes
	Austria	0.014	0.014	0.01 %	0.01 %					
	Germany	0.005	0.005	< 0.001 %	< 0.001 %					
	Netherlands	0.255	0.255	0.10 %	0.10 %					
	Cyprus	0.002	0.002	0.01 %	0.01 %					
	Hungary	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Romania	0.006	0.006	0.001 %	0.003 %					
4 B 6	Horses					7	0	20	no	yes
	Austria	0.105	0.105	0.10 %	0.07 %					
	Germany	0.092	0.092	0.009 %	0.007 %					
	Netherlands	0.706	0.699	0.269 %	0.270 %					
	Cyprus	0.001	0.001	0.004 %	0.005 %					
	Estonia	< 0.001	< 0.001	0.001 %	0.002 %					
	Hungary	0.013	0.015	0.01 %	0.01 %					
	Romania	0.080	0.078	0.02 %	0.04 %					
4 B 7	Mules and asses					2	2	23	no	yes
	Germany	0.001	0.001	< 0.001 %	< 0.001 %					
	Hungary	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
4 B 8	Swine					7	0	20	no	yes
	Austria	0.817	0.789	0.77 %	0.55 %					
	Germany	0.345	0.339	0.032 %	0.026 %					
	Netherlands	0.441	0.409	0.157 %	0.158 %					
	Cyprus	< 0.001	< 0.001	0.002 %	0.002 %					
	Estonia	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Hungary	0.006	0.005	0.00 %	0.00 %					
	Romania	0.230	0.226	0.05 %	0.10 %					

Table A4.1 NO_x emissions from the agriculture sector (cont.)

	NO_x Agriculture	2010 emissions	2011 emissions	% of ceiling (2011)	% of National Total (2011)	Number of countries that reported values	Number of countries that reported 'IE'	Number of countries that used other entries	Emission factor in EMEP/EEA GB available	Method in EMEP/EEA GB available
4 B 9 a	Laying hens					7	0	20	no	yes
	Austria	0.152	0.152	0.15 %	0.11 %					
	Germany	0.010	0.010	< 0.001 %	< 0.001 %					
	Netherlands	1.918	2.262	0.87 %	0.87 %					
	Cyprus	0.003	0.003	0.01 %	0.01 %					
	Estonia	0.002	0.002	0.00 %	0.00 %					
	Hungary	0.058	0.053	0.03 %	0.04 %					
	Romania	0.004	0.004	< 0.001 %	0.002 %					
4 B 9 b	Broilers					6	1	20	no	yes
	Germany	0.014	0.015	0.00 %	0.00 %					
	Netherlands	1.657	1.674	0.644 %	0.65 %					
	Cyprus	0.005	0.005	0.020 %	0.02 %					
	Estonia	0.001	0.001	0.00 %	0.00 %					
	Hungary	0.036	0.036	0.02 %	0.03 %					
	Romania	0.036	0.034	0.008 %	0.02 %					
4 B 9 c	Turkeys					3	3	21	no	yes
	Germany	0.007	0.007	< 0.001 %	< 0.001 %					
	Cyprus	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Hungary	0.026	0.024	0.01 %	0.02 %					
4 B 9 d	Other poultry					4	1	22	no	yes
	Austria	0.018	0.018	0.02 %	0.01 %					
	Germany	0.002	0.002	< 0.001 %	< 0.001 %					
	Estonia	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Hungary	0.035	0.036	0.02 %	0.03 %					
4 D 1 a	Synthetic N-fertilizers					8	1	18	no	yes
	Austria	0.872	1.022	0.99 %	0.71 %					
	Germany	61.865	70.439	6.70 %	5.45 %					
	Luxembourg	0.328	0.328	2.98 %	1.82 %					
	Spain	13.311	12.414	1.47 %	1.33 %					
	Cyprus	0.245	0.180	0.78 %	0.86 %					
	Estonia	1.046	1.092	1.82 %	3.06 %					
	Hungary	11.203	12.033	6.08 %	9.31 %					
	Poland	10.133	10.755	1.22 %	1.26 %					
4 D 2 a	Farm-level agricultural operations including storage, handling and transport of agricultural products					1	1	25	no	yes
	Germany	36.975	36.911	3.51 %	2.85 %					
4 D 2 b	Off-farm storage, handling and transport of bulk agricultural products					0	0	27	no	yes
4 D 2 c	N-excretion on pasture range and paddock unspecified					1	3	23	no	yes
	Germany	3.184	3.105	0.30 %	0.24 %					
4 F	Field burning of agricultural wastes					9	1	17	T1, T2	yes
	Austria	0.016	0.011	0.01 %	0.01 %					
	Denmark	0.089	0.088	0.07 %	0.07 %					
	Finland	0.011								
	France	0.879	0.875	0.11 %	0.09 %					
	Greece	1.361	1.403	0.41 %	0.47 %					
	Italy	0.461	0.502	0.05 %	0.05 %					
	Portugal	1.793	1.739	0.70 %	0.99 %					
	Spain	8.443	8.443	1.00 %	0.90 %					
	Bulgaria	3.840	3.840	1.55 %	3.32 %					
	Cyprus	0.005	0.005	0.02 %	0.02 %					
	Hungary	0.630								
4 G	Agriculture other					2	0	25	no	yes
	Austria	0.057	0.054	0.05 %	0.04 %					
	Latvia	0.012	0.008	0.01 %	0.02 %					

Table A4.2 NMVOC emissions from the agriculture sector

	NMVOC Agriculture	2010 emissions	2011 emissions	% of ceiling (2011)	% of National Total (2011)	Number of countries that reported values	Number of countries that reported 'IE'	Number of countries that used other entries	Emission factor in EMEP/EEA GB available	Method in EMEP/EEA GB available
4 B 1 a	Cattle dairy					4	0	23	no	yes
	Italy	0.105	0.105	0.01 %	0.01 %					
	Cyprus	0.319	0.327	2.34 %	3.40 %					
	Estonia	1.312	1.308	2.670 %	3.95 %					
	Romania	16.028	15.694	3.00 %	4.43 %					
4 B 1 b	Cattle non-dairy					4	0	23	no	yes
	Italy	0.245	0.249	0.02 %	0.02 %					
	Cyprus	0.220	0.243	1.74 %	2.53 %					
	Estonia	1.035	1.052	2.15 %	3.18 %					
	Romania	5.839	5.994	1.15 %	1.69 %					
4 B 13	Other					0	0	27	no	yes
4 B 2	Buffalo					1	0	26	no	yes
	Italy	0.022	0.021	0.002 %	0.002 %					
4 B 3	Sheep					4	0	23	no	yes
	Italy	0.040	0.040	0.00 %	0.00 %					
	Cyprus	0.046	0.049	0.35 %	0.51 %					
	Estonia	0.017	0.018	0.036 %	0.053 %					
	Romania	1.683	1.707	0.33 %	0.48 %					
4 B 4	Goats					3	1	23	no	yes
	Italy	0.005	0.005	< 0.001 %	< 0.001 %					
	Cyprus	0.055	0.041	0.30 %	0.43 %					
	Romania	0.248	0.247	0.05 %	0.07 %					
4 B 6	Horses					1	0	26	no	yes
	Italy	0.012	0.012	< 0.001 %	0.00 %					
4 B 7	Mules and asses					1	1	25	no	yes
	Italy	0.001	0.002	< 0.001 %	< 0.001 %					
4 B 8	Swine					4	0	23	no	yes
	Italy	0.159	0.160	0.01 %	0.02 %					
	Cyprus	1.239	1.108	7.92 %	11.52 %					
	Estonia	0.934	0.931	1.90 %	2.81 %					
	Romania	24.513	24.496	4.68 %	6.91 %					
4 B 9 a	Laying hens					3	0	24	no	yes
	Cyprus	0.167	0.178	1.27 %	1.85 %					
	Estonia	0.173	0.171	0.35 %	0.52 %					
	Romania	13.351	13.639	2.61 %	3.85 %					
4 B 9 b	Broilers					3	1	23	no	yes
	Cyprus	0.322	0.307	2.20 %	3.20 %					
	Estonia	0.142	0.142	0.29 %	0.43 %					
	Romania	3.634	3.438	0.66 %	0.97 %					
4 B 9 c	Turkeys					1	2	24	no	yes
	Cyprus	0.013	0.010	0.07 %	0.10 %					
4 B 9 d	Other poultry					1	0	26	no	yes
	Estonia	0.044	0.054	0.11 %	0.16 %					
4 D 1 a	Synthetic N-fertilizers					7	0	20	no	yes
	Ireland	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Luxembourg	0.184	0.184	2.04 %	2.06 %					
	Bulgaria	24.877	24.877	14.22 %	26.31 %					
	Cyprus	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Estonia	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Hungary	< 0.001								
	Latvia	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Poland	0.006	0.006	< 0.001 %	< 0.001 %					
4 D 2 a	Farm-level agricultural operations including storage, handling and transport of agricultural products					0	0	27	no	yes
4 D 2 b	Off-farm storage, handling and transport of bulk agricultural products					0	0	27	no	yes
4 D 2 c	N-excretion on pasture range and paddock unspecified					0	0	27	no	yes

Table A4.2 NMVOC emissions from the agriculture sector (cont.)

	NMVOC Agriculture	2010 emissions	2011 emissions	% of ceiling (2011)	% of National Total (2011)	Number of countries that reported values	Number of countries that reported 'IE'	Number of countries that used other entries	Emission factor in EMEP/EEA GB available	Method in EMEP/EEA GB available
4 F	Field burning of agricultural wastes					10	0	17	T1, T2	yes
	Austria	0.098	0.077	0.05 %	0.06 %					
	Denmark	0.232	0.230	0.27 %	0.29 %					
	Finland		0.038	0.03 %	0.03 %					
	France	2.453	2.404	0.23 %	0.33 %					
	Italy	0.594	0.635	0.05 %	0.06 %					
	Portugal	1.955	1.885	1.05 %	1.06 %					
	Spain	55.647	55.647	8.41 %	9.31 %					
	Bulgaria	7.681	7.681	4.39 %	8.12 %					
	Cyprus	0.014	0.012	0.09 %	0.13 %					
	Hungary	0.937								
	Poland	0.224	0.356	0.04 %	0.05 %					
4 G	Agriculture other					3	0	24	no	yes
	Austria	1.683	1.876	1.18 %	1.49 %					
	Netherlands	0.183	0.183	0.10 %	0.13 %					
	Slovakia	0.440	0.438	0.31 %	0.64 %					

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European Environment Agency
Kongens Nytorv 6
1050 Copenhagen K
Denmark

Tel.: +45 33 36 71 00
Fax: +45 33 36 71 99

Web: eea.europa.eu
Enquiries: eea.europa.eu/enquiries

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European Environment Agency