

# NEC Directive status report 2007

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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# Summary

The National Emission Ceilings Directive (NECD)<sup>(1)</sup> requires all 27 Member States of the European Union to report annually information concerning emissions and projections for four main air pollutants: sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), non-methane volatile organic compounds (NMVOCs), and ammonia (NH<sub>3</sub>). These pollutants harm both human health and the environment by contributing to formation of ozone and particulate matter and leading to acidification and eutrophication. In order to help protect human health and the environment, the NECD sets pollutant-specific and legally-binding emission ceilings for each country that must be met by 2010.

This report presents the status of the most recent information provided under the NECD in 2007<sup>(2)</sup>. It provides details of the emissions for the year 2006 and projections for 2010 as reported by Member States, as well as the aggregated European Community NECD emissions and projections. For the first time since reporting began under the NECD, all Member States submitted at least some of the data required by the directive.

## Comparison of projected emissions with the NECD emission ceilings for 2010

The reported projections data show that only 11 Member States anticipate they will meet all four of the pollutant-specific emission ceilings specified in the NECD<sup>(3)</sup>, with the remaining 15 Member States indicating they will miss at least one of their respective ceilings (Table ES.1). Projections data were not submitted by one Member State, Luxembourg.

As noted in last year's NECD status report<sup>(4)</sup>, the 2010 emission ceiling for NO<sub>x</sub> remains the most difficult of the four ceilings for many Member States to meet. Thirteen Member States have now reported that they anticipate missing their NO<sub>x</sub> ceiling. Five Member States (Denmark, France, Poland, Portugal and Spain) indicate they will miss their NMVOC ceiling; two Member States — their NH<sub>3</sub> ceiling (Germany and Spain), and one Member State (the Netherlands) — its SO<sub>2</sub> ceiling. Belgium, France, Germany and the Netherlands have however indicated that, by implementing additional measures to further reduce emissions, they could still achieve their 2010 emissions ceilings. In addition, by 2010 a number of Member States will have successfully reduced emissions of certain pollutants significantly below the levels required by the NECD ceilings, i.e. they will have over-achieved compared to their original commitments for these pollutants.

The reported 'with measures' (WM) projections data reported by Bulgaria, Finland, Greece, Ireland and Lithuania are identical to the respective NECD ceilings for at least one of the four NECD pollutants. Therefore, even small increases in the volume of emissions above their WM projections would lead to these Member States also exceeding their ceilings for these pollutants.

The data reported in 2007 include for the first time the data for the two new Member States, Bulgaria and Romania, which joined the European Union on 1 January 2007. Both anticipate meeting their emission ceilings for all four pollutants.

(1) Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants OJ L 309, 27.11.2001, p. 22; as amended.

(2) Eighteen out of 27 Member States officially reported their national inventories of SO<sub>2</sub>, NO<sub>x</sub>, NMVOC and NH<sub>3</sub> by the required reporting date of 31 December 2007, while the remaining Member States reported data after the deadline. Ten Member States provided additional or revised data between 1 January and 31 July 2008.

(3) Emission ceilings are compared against reported 'with measures' (WM) projections. WM projections take into account currently implemented and adopted policies and measures. Where countries have instead reported only 'business as usual' (BAU) or 'current legislation projection' (CLP) projections, it is assumed, for comparison against the ceilings, that these are equivalent to a WM projection.

(4) NEC Directive status report 2006 (EEA, 2007).

At the aggregated European Community level, the WM projections reported by the Member States imply that for some pollutants, the emission ceilings for the EU-27 (defined in Annex I and II of the NECD) <sup>(5)</sup> may be exceeded for some pollutants. Only for SO<sub>2</sub> and NH<sub>3</sub> is the EU-27 likely to meet both the aggregated ceilings set in Annex I and II (Figure ES.1).

Specifically for the four NECD pollutants:

- the projected NO<sub>x</sub> emissions for the EU-27 <sup>(6)</sup> are 9 % above the aggregate emission ceiling given in Annex I (calculated on the basis of the individual Member State ceilings defined in the

NECD), and 20 % — above the stricter Annex II ceiling of the NECD for the EU-27 as a whole;

- NMVOC projections for the EU-27 are 9 % below the aggregated emission ceiling given in Annex I for 2010, but still 6 % above the Annex II ceiling;
- the EU-27 as a whole is projected to be 31 % below the aggregate Annex I SO<sub>2</sub> ceiling and 27 % below the Annex II SO<sub>2</sub> ceiling;
- the NH<sub>3</sub> WM projections are 7 % below the aggregated EU-27 Annex I emission ceiling. There is no separate ceiling for NH<sub>3</sub> defined in Annex II of the NECD.

**Table ES.1 Overview of 'with measures' (WM) projections as reported by Member States**

Member State	NO <sub>x</sub>	NMVOCs	SO <sub>2</sub>	NH <sub>3</sub>
Austria	x	√	√	√
Belgium	x	√	√	√
Bulgaria	√	√	√	√
Cyprus	√	√	√	√
Czech Republic	√	√	√	√
Denmark	x	x	√	√
Estonia	√	√	√	√
Finland	√	√	√	√
France	x	x	√	√
Germany	x	√	√	x
Greece	√	√	√	√
Hungary	x	√	√	√
Ireland	x	√	√	√
Italy	x	√	√	√
Latvia	√	√	√	√
Lithuania	√	√	√	√
Luxembourg	-	-	-	-
Malta	√	√	√	√
Netherlands	x	√	x	√
Poland	√	x	√	√
Portugal	√	x	√	√
Romania	√	√	√	√
Slovakia	√	√	√	√
Slovenia	x	√	√	√
Spain	x	x	√	x
Sweden	x	√	√	√
United Kingdom	x	√	√	√

**Note:** Luxembourg did not report projected emissions.

'√' indicates that a Member State anticipates meeting or surpassing its respective emission ceiling on the basis of currently implemented and adopted policies and measures.

'x' indicates that a ceiling will not be met without implementing additional measures to reduce emissions.

<sup>(5)</sup> Annexes I and II of 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 Community as a whole, the interim environmental objectives set out in Article 5 of the NECD (i.e. a reduction of acidification, health- and vegetation-related ground-level ozone exposure by 2010 compared with the 1990 situation). There is no separate ceiling for NH<sub>3</sub> defined in Annex II of the NECD.

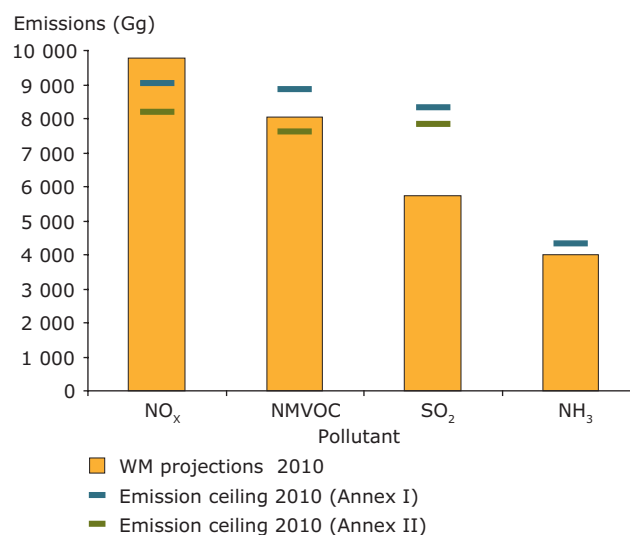
<sup>(6)</sup> EU-27 WM projections are based on the aggregated WM projections data reported by the individual Member States (without data from Luxembourg).



## Past emission trends

Due to the fact that a number of countries have submitted incomplete inventories (for both the most recent and previous reporting cycles), it is not yet possible to build a complete picture of the long-term emission trends (either within each individual Member State or for the EU-27 as a whole) on the basis of data submitted under the NECD. However, the available data do show quite clearly that there has been a decrease in emissions of the four NECD pollutants in the majority of the Member States. A number of Member States have already succeeded in reducing emissions in line with the requirements of the NECD, or are projected to do so before 2010 as noted earlier. A more complete picture of the past emission trends in the European Community is provided by the European Community's emission inventory submission to the UNECE LRTAP Convention <sup>(7)</sup>.

**Figure ES.1 Comparison of 2010 aggregated 'with measures' projections data reported by the Member States and the EU-27 emission ceilings to be attained by 2010**



**Note:** EU-27 WM projections are based on the aggregated WM projections data reported by the individual Member States (excluding data from Luxembourg which were not reported). The emission ceilings shown are the aggregated EU-27 emission ceilings defined in Annex I and Annex II of the NECD. Annex II of the NECD does not define a ceiling for NH<sub>3</sub>.

<sup>(7)</sup> Annual European Community LRTAP Convention emission inventory report 1990–2006 (EEA, 2008).

# 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...'*

The National Emission Ceilings Directive (NECD) <sup>(8)</sup> highlights the importance of reporting air pollutant emission data for assessing progress in reducing air pollution in the European Community region and for ascertaining the compliance of the Member States with their commitments. This report provides an overview of the NECD data submitted by Member States from December 2007, and a summary of the emission trends. It also presents projections of sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), non-methane volatile organic compounds (NMVOCs) <sup>(9)</sup>, and ammonia (NH<sub>3</sub>) emissions for the year 2010, as based on the data reported by the Member States. The report was prepared on behalf of the European Environment Agency (EEA) by its European Topic Centre on Air and Climate Change (ETC/ACC).

By providing summary information on the status of reporting carried out by the Member States, this report helps the European Environment Agency (EEA) and the European Commission to communicate with the constituent countries. The information contained is of use for the European Commission and the EEA when they seek to improve further the reporting, under the NECD, of air emissions data and other related information.

Throughout this report, the term 'European Union' refers to the 27 Member States as of 31 December 2007: Austria, Belgium, Bulgaria, Cyprus, 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.

## 1.1 Reporting obligations under the NECD

Articles 2, 6, 7 and 8 of the National Emission Ceilings Directive (NECD) set forth the requirements for the EU-27 Member States concerning their national inventories, projections and programmes. As specified in the directive, Member States shall prepare and annually update national total emissions and emission projections for 2010 for the pollutants SO<sub>2</sub>, NO<sub>x</sub>, NMVOC, and NH<sub>3</sub>. In addition, by 31 December of each year, the Member States shall report to the European Commission and the EEA their national emission inventories and emission projection for the year 2010; final emissions data should be submitted for the previous year but one, and provisional emissions data for the previous year. Anticipated significant changes in the geographical distribution of national emissions shall also be indicated.

The Member States were obliged to report to the European Commission their updated national programmes for progressive reduction of national emissions of SO<sub>2</sub>, NO<sub>x</sub>, NMVOC and NH<sub>3</sub> by 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 the 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 the information on emissions reported by the 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

<sup>(8)</sup> Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants OJ L309, 27.11.2001, p. 22; as amended by Council Directive 2006/105/EC of 20 November 2006, OJ L363, 20.12.2006, p. 368; the Act concerning the conditions of accession of the Czech Republic, the Republic of Estonia, the Republic of Cyprus, the Republic of Latvia, the Republic of Lithuania, the Republic of Hungary, the Republic of Malta, the Republic of Poland, the Republic of Slovenia and the Slovak Republic, and the adjustments to the Treaties on which the European Union is founded, OJ L236 23.9.2003 p. 33. A consolidated version of the NEC Directive is available at: [http://ec.europa.eu/environment/air/pdf/nec\\_eu\\_27.pdf](http://ec.europa.eu/environment/air/pdf/nec_eu_27.pdf).

<sup>(9)</sup> The NEC Directive defines VOCs as being non-methane volatile organic compounds (NMVOC).

Convention on Long-range Transboundary Air Pollution (LRTAP Convention). They are also requested (Annex III of NECD) that in preparing these inventories and projections, they should use the joint EMEP/CORINAIR Emission Inventory Guidebook (EMEP/EEA, 2007).

It is considered good practice that the Member States, in preparing their emission inventories and projections under the NECD, will ensure adherence to the principles outlined in the UNECE Guidelines for Estimating and Reporting Emission Data under the Convention on Long-range Transboundary Air Pollution (UNECE, 2003). The historic and projected emissions data presented must be 'transparent, consistent, comparable, complete and accurate'.

The EMEP/CORINAIR Guidebook allows the Member States to use various national or international methodologies to estimate emissions and projections, as long as such methods are considered to be more representative of the national situation and are compatible with the Guidebook. When using alternative methods, it is important that a description of the chosen alternative method is provided. To comply with the quality requirements of consistency in inventories, time-series data provided for the NECD should be calculated in a consistent manner. Where methods are revised, these revisions should also be applied to the other years of the inventory, and new estimates for these years should be compiled and reported.

### 1.1.1 Scope

The NECD covers emissions from all sources of NO<sub>x</sub>, NMVOCs, SO<sub>2</sub> and NH<sub>3</sub>, 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 Azores.

### 1.1.2 Accessibility of information

As specified in Article 7 of the NECD, the European Commission, assisted by the EEA, shall, in cooperation with the Member States and on the basis of the information provided by them, establish inventories and projections for the relevant pollutants. The inventories and projections shall be made publicly available<sup>(10)</sup>.

### 1.1.3 Emission ceilings

By the year 2010 at the latest, the Member States shall limit their annual emissions of SO<sub>2</sub>, NO<sub>x</sub>, NMVOC and NH<sub>3</sub> to the ceilings defined in the directive. In this report, emissions by the Member States in 2006 and their projections for 2010 are compared with the emission ceilings which are defined in Annex I of the NECD. Emission ceilings for the EU-27 Member States and the European Community as a whole (as defined in Annexes I and II of the NECD) are shown in Tables 1 and 2.

The emission ceilings (Table 2), as given in Annex II of the NECD, are designed with the aim of attaining the interim environmental objectives as set out in Article 5 of the NECD for the European Community as a whole by 2010. Meeting those objectives is expected to result in a reduction of acidification, health- and vegetation-related ground-level ozone exposure by 2010 compared with the 1990 situation. The Annex II emission ceilings for the European Community are stricter than the aggregated Member State emission ceilings given in Annex I of the NECD. There is no ceiling for NH<sub>3</sub> in Annex II of the NECD.

<sup>(10)</sup> Data submitted by MS under the NECD is available through the Dataservice of the EEA: <http://dataservice.eea.europa.eu/dataservice/>.

**Table 1 National EU emission ceilings for SO<sub>2</sub>, NO<sub>x</sub>, NMVOC and NH<sub>3</sub> (in Gg) to be attained by 2010 as defined in Annex I of the NECD**

Member State	SO <sub>2</sub> kilotonnes	NO <sub>x</sub> kilotonnes	NMVOC kilotonnes	NH <sub>3</sub> kilotonnes
Austria	39	103	159	66
Belgium	99	176	139	74
Bulgaria (a)	836	247	175	108
Cyprus	39	23	14	9
Czech Republic	265	286	220	80
Denmark	55	127	85	69
Estonia	100	60	49	29
Finland	110	170	130	31
France	375	810	1 050	780
Germany	520	1 051	995	550
Greece	523	344	261	73
Hungary	500	198	137	90
Ireland	42	65	55	116
Italy	475	990	1 159	419
Latvia	101	61	136	44
Lithuania	145	110	92	84
Luxembourg	4	11	9	7
Malta	9	8	12	3
Netherlands	50	260	185	128
Poland	1 397	879	800	468
Portugal	160	250	180	90
Romania (a)	918	437	523	210
Slovakia	110	130	140	39
Slovenia	27	45	40	20
Spain	746	847	662	353
Sweden	67	148	241	57
United Kingdom	585	1 167	1 200	297
<b>EU-27</b>	<b>8 297</b>	<b>9 003</b>	<b>8 848</b>	<b>4 294</b>

**Note:** (a) These emission ceilings are temporary and are without prejudice to the review of the NEC Directive according to Article 10.

**Table 2 European Community emission ceilings for SO<sub>2</sub>, NO<sub>x</sub> and NMVOC (in Gg) to be attained by 2010 as defined in Annex II of the NECD**

	SO <sub>2</sub> kilotonnes	NO <sub>x</sub> kilotonnes	NMVOC kilotonnes
EU-27	7 832	8 180	7 585

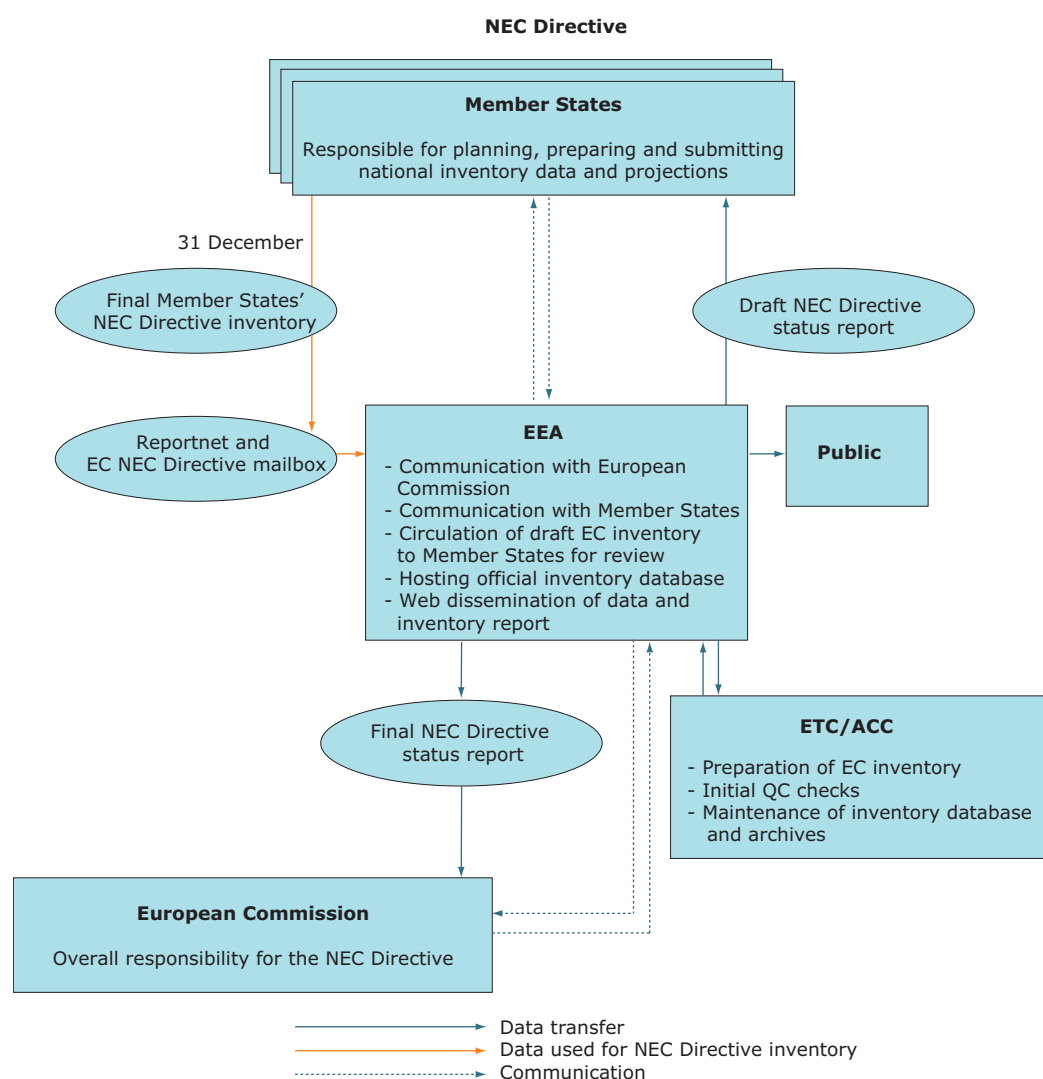
## 1.2 Preparation of NECD inventories in the European Community

### 1.2.1 Institutional arrangements and dataflow

Within this legal framework, preparation of the aggregated European Community NECD inventory involves several stages: the Member States providing their data, the European Commission and EEA receiving the data, and the EEA (via its ETC/ACC) compiling the data and preparing the actual inventory data and inventory report. The EEA and the European Commission also communicate with the Member States and disseminate the results.

For reporting purposes, the EU Member States are requested to make use of the EEA's Eionet ReportNet tools. Within the Eionet priority dataflow agreement with the EEA member countries, the EEA requests a copy of the report containing the NECD emissions, projections and programmes as reported to the European Commission. The EU acceding and candidate countries are encouraged by the European Commission to provide data on a voluntary basis.

A flowchart diagram illustrating the dataflow that is necessary to compile the European Community's NECD emission inventory is presented in Figure 1.

**Figure 1** Dataflow for the compilation of the EU NEC Directive emission inventory

### 1.2.2 Inventory QA/QC activities

To ensure the data quality and to verify and validate their emissions data, the Member States are encouraged to use appropriate QA/QC procedures. These procedures should be consistent with those described in the EMEP/CORINAIR Guidebook.

There is no formal quality assurance and quality control (QA/QC) plan in place for the European Community's NECD inventory. The main activities enhancing the quality of the inventory are the checks performed by EEA-ETC/ACC on the status of each submission. More detailed quality assurance activities are performed by the EEA-ETC/ACC and EMEP (European monitoring evaluation programme) in the process of annual reviews of emission inventories. The review

process includes checks on timeliness, consistency, accuracy, completeness and comparability. A summary of the review findings is published annually (e.g. CEIP/EEA, 2008).

All NECD inventory documents (submissions, inventory master file, inventory report, status reports and related correspondence) are archived electronically at the EEA-ETC/ACC.

### 1.2.3 Differences between NECD, LRTAP Convention and UNFCCC inventory reporting

In addition to reporting emissions data under the NECD, the Member States are also required to report emissions of certain pollutants under two other international reporting obligations: the

UNECE LRTAP Convention, and the EU Monitoring Mechanism <sup>(11)</sup> and its implementing provisions <sup>(12)</sup>. Table 3 provides an overview of the various air pollution reporting obligations for the Member States.

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. France, Spain, Portugal or the United Kingdom), and the inclusion of domestic and international aviation and navigation in the national total. The LRTAP Convention and UNFCCC inventories differ only in the pollutants included and slightly in the sector split. The major differences are summarised in Table 4.

**Table 3 Overview of air emission reporting obligations in the European Community**

Legal obligation	Reporting requirements	Annual reporting deadline for EU Member States	Annual EC reporting deadline	
CLRTAP	1979 Convention on Long-range Transboundary Air Pollution	Emissions of SO <sub>x</sub> (as SO <sub>2</sub> ), NO <sub>x</sub> (as NO <sub>2</sub> ), NH <sub>3</sub> , NMVOC, CO, heavy metals (HMs), persistent organic pollutants (POPs), and particulate matter (PM)	15 February	15 February
NECD	Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants	Emissions of SO <sub>2</sub> , NO <sub>x</sub> , NMVOC, NH <sub>3</sub>	31 December	–
UNFCCC	Council Decision 280/2004/EC, concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol	Emissions of CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O, HFCs, PFCs, SF <sub>6</sub> , NO <sub>x</sub> , CO, NMVOC, SO <sub>2</sub>	15 January (*) (to the European Commission) 15 April (to the UNFCCC)	15 April

**Note:** (\*) Deadline for submission of GHG projections to the European Commission is 15 March.

**Table 4 Major differences between the reporting obligations as defined by the LRTAP Convention, NECD and the Council Decision 280/2004/EC**

	NECD	LRTAP Convention (NFR) <sup>(a)</sup>	UNFCCC (CRF) <sup>(b)</sup>
Air pollutants	NO <sub>x</sub> , SO <sub>2</sub> , VOCs <sup>(c)</sup> , NH <sub>3</sub>	NO <sub>x</sub> , SO <sub>x</sub> , CO, NMVOC, NH <sub>3</sub> , HMs, POPs, PM	NO <sub>x</sub> , SO <sub>2</sub> , NMVOC, CO
Domestic aviation (LTO)	Included in national total	Included in national total	Included in national total
Domestic aviation (Cruise)	<i>Not included in national total</i>	Included in national total	Included in national total
International aviation (LTO)	Included in national total	<i>Not included in national total</i>	<i>Not included in national total</i>
International aviation (Cruise)	<i>Not included in national total</i>	<i>Not included in national total</i>	<i>Not included in national total</i>
National navigation (domestic shipping)	Included in national total	Included in national total	Included in national total
International inland shipping	Included in national total	<i>Not included in national total</i>	<i>Not included in national total</i>
International maritime	<i>Not included in national total</i>	<i>Not included in national total</i>	<i>Not included in national total</i>
Road transport	Emissions calculated on the basis of fuel sold or consumed		Emissions calculated on the basis of fuel sold

**Note:** <sup>(a)</sup> NFR = Nomenclature for reporting – sectoral classification system developed by UNECE/EMEP for the reporting of air emissions.

<sup>(b)</sup> CRF = Common reporting format – sectoral classification system developed by UNFCCC for reporting of greenhouse gases.

<sup>(c)</sup> The NECD defines VOCs as being non-methane volatile organic compounds.

<sup>(11)</sup> Decision No 280/2004/EC of the European Parliament and of the Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol, OJ L 49, 19.2.2004, p. 1.

<sup>(12)</sup> Commission Decision of 10 February 2005 laying down rules implementing Decision No 280/2004/EC of the European Parliament and of the Council of 11 February 2004 concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol, OJ L 55, 1.3.2005, p. 57.

## 2 Status of reporting

Information in this section is based on submissions from the Member States delivered to the EEA via the Eionet ReportNet Central Data Repository (CDR), as well as submissions delivered directly to the Commission, and explanatory information provided by the Member States directly to ETC/ACC. Trend tables contain, amongst other data, the information on emissions submitted by the Member States under the NECD in previous reporting cycles (see Appendix I (Table A.1)).

### 2.1 Timeliness

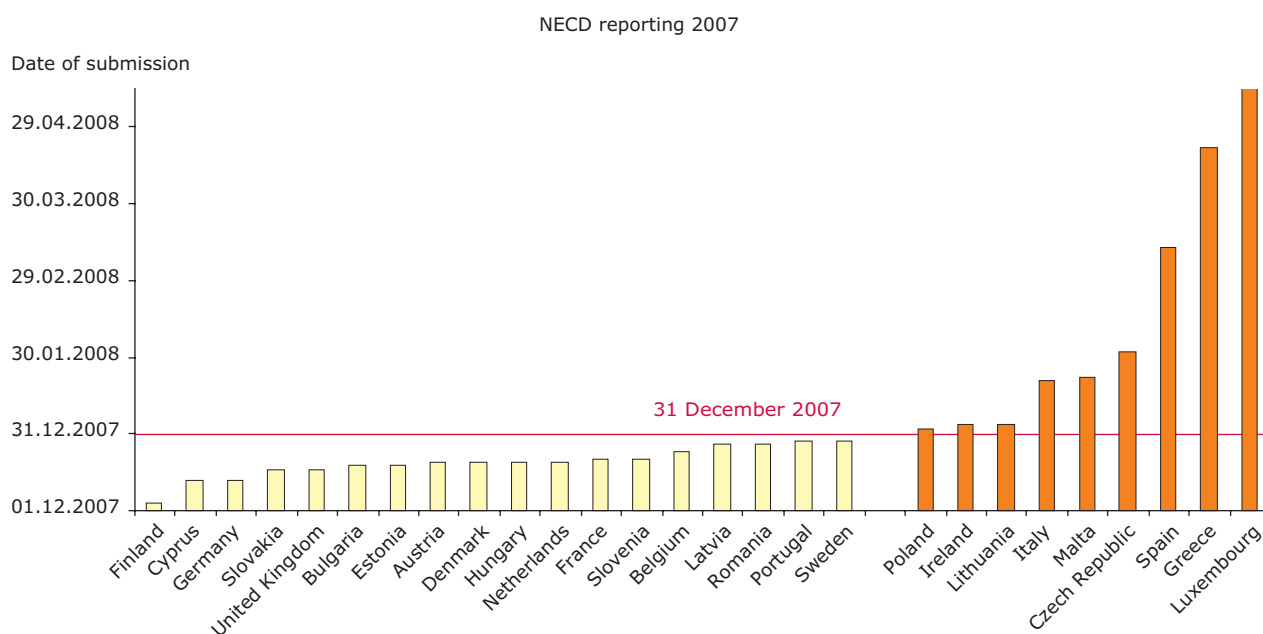
Pursuant to Article 8 of the NECD, by 31 December each year, the Member States are required to report their emission inventories for the previous year but one, along with preliminary emission inventories for the previous year. Emission projections for the year 2010 should also be submitted by the same date. In the 2007 reporting round, 18 out of 27 Member States submitted their national inventories of SO<sub>2</sub>, NO<sub>x</sub>, NMVOC and NH<sub>3</sub> to the Commission

before 31 December 2007. Czech Republic, Ireland, Italy, Lithuania, Malta and Poland delivered their inventories between 1 January and 1 February 2008, Spain — on 13 March, Greece — on 21 April 2008, and Luxembourg — by 9 July 2008 (see Figure 2 and Appendix II (Table A.3)). Ten Member States provided additional or revised data between 1 January and 31 July 2008. This was the first instance since reporting began under the NECD that all Member States submitted at least some data.

### 2.2 Completeness

In the 2007 reporting cycle<sup>(13)</sup>, 26 Member States provided the mandatory information on final emissions for the year 2005 (exception was Greece) and 27 Member States submitted, as required, preliminary emission data for 2006. Greece did not report NH<sub>3</sub> emissions for either 2005 or 2006. The 2010 projections were not provided by only one Member State (Luxembourg).

**Figure 2** Status of reporting — date of first NECD inventory provision to the CDR or European Commission



<sup>(13)</sup> The reporting deadline for the 2007 reporting cycle was 31 December 2007.

As no agreed gap-filling procedures are in place with respect to the NECD reporting, compilation of a complete EU-27 inventory for 2005 and 2006 is not possible for as long as any number of countries have not reported their complete emission inventories (Appendix II, Table A.3). It must be noted, however, that this compilation is required in order to allow comparison with the EU-27 ceilings as defined in Annex I and II of the NECD.

### **2.3 Consistency and comparability**

The NECD does not require that emissions data should be provided using a standard format. However, when estimating and reporting emissions, the Member States are encouraged by the European Commission and EEA to use the standardised NFR templates as defined in the EMEP Guidelines (UNECE, 2003). Only

nine Member States (twelve in 2006) — Austria, Denmark, France, Greece, Ireland, Italy, Luxembourg, Portugal and Spain — provided emissions in a comparable and consistent format using the standard Excel template (NFR Table 1a).

Emission inventories from the remaining 18 Member States were submitted in the form of modified Excel tables. When information is provided in a non-standard format, it significantly complicates the processing and the analysis of the data. Automated consistency and completeness tests could be performed for these 12 countries only after the ETC/ACC converted their submissions into the NFR standard tables. More detailed information about the quality of the 2007 NECD submissions is provided in the joint EEA and EMEP/CEIP Inventory Review 2008 report (CEIP/EEA, 2008).



# 3 Member State emission trends and projections

## 3.1 Introduction

### 3.1.1 Emissions

Sections 3.2 and onwards show trends in emissions of NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, and NH<sub>3</sub>, as reported by the Member States under the NECD. Totals for the EU-27 are available only for some years — because of a lack of complete time-series data at the level of individual Member States. *It must be noted that the NECD does not require that Member States should report annually a complete time series of emissions from 1990 onwards.*

Table A.1 in Appendix I provides an overview of the data available from the current and previous NECD reporting rounds used in trend tables (Tables 7, 9, 11 and 13). Emission data that may have been reported to other bodies (e.g. the LRTAP Convention or EU Monitoring Mechanism/UNFCCC) have not been used to gap-fill missing NECD data.

### 3.1.2 Projections

There are three basic different types of projections that the Member States can provide (AEA Technology, 2007). These include *'without*

*measures'* (WOM) (in some reports referred to as *'business as usual'* (BAU)), *'with measures'* (WM) and *'with additional measures'* (WAM) projections. Definitions for each of the above are provided in Box 1 and are taken directly from the CAFE Working Group on Implementation guidelines (CAFE 2006). The Member States providing projections in the EMEP NFR file template Table 2a refer to current legislation scenarios (CLS) and current reduction plans (CRP). In these instances CLS has been taken to correspond to WM projections and CRP to WAM projections.

The scenarios in Box 1 reflect the requirements of the directive to provide information on the adopted and envisaged policies and measures. The Directive also requires quantified estimates of the effect of these policies and measures on emissions of the pollutants by 2010 (Article 6(2)). When choosing a name for their respective projection scenarios, the Member States have demonstrated a certain ambiguity of usage. For example, some Member States have used the term *'business as usual'* (BAU)<sup>(14)</sup> to mean *'without measures'*, whereas some other Member States have used the term to mean *'with measures'* (AEA Technology, 2007).

Updated data on projections are available from 26 Member States (Table 5). Luxembourg has not submitted any of the projections required by the NECD. In the first instance, the information on projections was obtained from the Excel projection template files submitted. Additional sources (such as the national plans and programmes reports, informative inventory reports or explanatory notes) were searched for information only in cases when the Member States did not provide such tables. Appendix I (Table A.2) provides an overview of the sources of national projections data which were used in this status report.

The aggregated WM projections reported by the Member States were compared (Table 6 and Figure 3) with the EU-27 emission ceilings as

#### Box 1 Projection scenarios as defined in the CAFE WGI reporting guidelines

A **with measures** projection is taking into account all currently implemented and adopted policies and measures;

A **with additional measures** projection is taking into account all planned policies and measures;

A **business as usual** (or **without measures**) projection should exclude all policies and measures implemented, adopted or planned after the year chosen as the starting year for the projection.

<sup>(14)</sup> Henceforth, the term *'business as usual'* (BAU) is not further used in this report — due to the ambiguity concerning its definition. It is replaced with WOM. *'Current legislation projections'* (CLP) are presented in the overview table as WM projections and *'Current reduction plans'* (CRP) are presented as WAM projections.

**Table 5** Overview of Member State emission projections as submitted under NECD, status as of 15 July 2008 and emission ceilings 2010

Member State	NO <sub>x</sub> projections (Gg)			NO <sub>x</sub>			NMVOCs projections (Gg)			NMVOCs			SO <sub>2</sub> projections (Gg)			SO <sub>2</sub>			NH <sub>3</sub> projections (Gg)			NH <sub>3</sub>		
	WM	WAM	Ceilings	WM	WAM	Ceilings	WM	WAM	Ceilings	WM	WAM	Ceilings	WM	WAM	Ceilings	WM	WAM	Ceilings	WM	WAM	Ceilings	WM	WAM	Ceilings
Austria	154		103	140		159	26		39	62		66												
Belgium	196	175	176	129	122	139	90	75	99	70	70	74												
Bulgaria	247	247	247	175	175	175	380	380	836	108	108	108												
Cyprus	19		23	10		14	34		39	5		9												
Czech Republic	275		286	164		220	206		265	61		80												
Denmark	136		127	88		85	20		55	65		69												
Estonia	39		60	41		49	80		100	9		29												
Finland	151		170	130		130	98		110	31		31												
France	1 105	1 050	810	1 060	1 040	1 050	345	330	375	730	730	780												
Germany	1 112	1 051	1 051	987	995	995	459	459	520	610	550	550												
Greece	344	310	344	261	235	261	523	315	523	73	50	73												
Hungary	211		198	134		137	135		500	87		90												
Ireland	98	93	65	55		55	33		42	102		116												
Italy	1 057		990	941		1 159	376		475	416		419												
Latvia	49		61	65		136	5		101	15		44												
Lithuania	110	44	110	92	56	92	145	37	145	84	55	84												
Luxembourg	n/a	n/a	11	n/a	n/a	9	n/a	n/a	4	n/a	n/a	7												
Malta	8		8	4		12	9		9	2		3												
Netherlands	262	261	260	154	154	185	53	49	50	125	123	128												
Poland	853		879	940		800	934		1 397	302		468												
Portugal	242	242	250	194	194	180	133	133	160	69	69	90												
Romania	306	299	437	347	340	523	732	563	918	205	198	210												
Slovakia	115		130	86		140	62		110	24		39												
Slovenia	49	49	45	37	37	40	17	17	27	19	19	20												
Spain	1 211		847	839		662	421		746	373		353												
Sweden	154		148	183		241	33		67	50		57												
United Kingdom	1 294		1 167	807		1 200	405		585	292		297												

**Note:** France, in addition to providing WM and WAM projections reported a projection 'Avec Marché de Carbone'.

specified in Annex I of the NECD (Table 1). This analysis shows that with current measures in place, emissions in the EU-27 are anticipated to be greater than the aggregated 2010 ceiling for NO<sub>x</sub> but lower than the ceilings for the remaining pollutants (SO<sub>2</sub>, NMVOC and NH<sub>3</sub>). In contrast, of

the three Annex II emission ceilings (Table 2) which are designed with the aim of broadly meeting the interim environmental objectives as set out in Article 5 of the NECD, only the ceiling for SO<sub>2</sub> will be met, while that for NO<sub>x</sub> or NMVOC is not projected to be achieved.

**Table 6** Sum of EU Member State projections compared with EU-27 emission ceilings as defined in Annex I and Annex II of the NECD

	WM projections (Gg)	Annex I emission ceilings (Gg)	Difference from WM (Gg)	Difference from WM (%)	Annex II emission ceilings (Gg)	Difference from WM (Gg)	Difference from WM (%)
NO <sub>x</sub>	9 796	9 003	793	9 %	8 180	1 616	20 %
NMVOC	8 062	8 848	- 786	- 9 %	7 585	477	6 %
SO <sub>2</sub>	5 752	8 297	- 2 545	- 31 %	7 832	- 2 080	- 27 %
NH <sub>3</sub>	3 989	4 294	- 305	- 7 %			

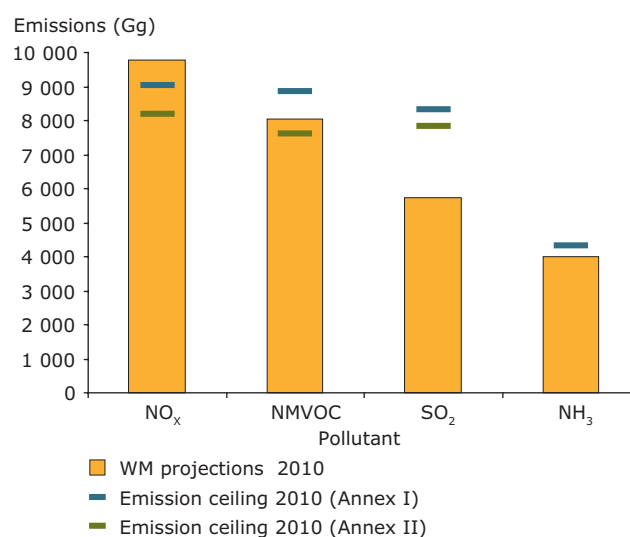
**Note:** EU-27 WM projections are based on the reported WM projections (without data from Luxembourg).

The trend tables (Tables 7–10) in the following sections show, for each pollutant, a comparison<sup>(15)</sup> between the emissions for 2006 and those reported for the years 2005 and 1990. This illustrates the development of the emission trends within individual Member States and across the EU-27 as a whole. Figures 4, 7, 10 and 13 illustrate the relative difference<sup>(16)</sup> between, firstly, emissions in 2006 and the emission ceilings; and secondly, Member State projected emissions for 2010 and the respective ceilings. In cases where percentage values are positive, it indicates for the respective figures that:

- actual emissions are currently above the emission ceilings;
- the ceiling will not be achieved — according to the projections with measures (WM) — by 2010 without the respective Member States taking additional measures in order to reduce emissions further.

Note that the EU-27 'with measures' projections, provided in tables and graphs in this report, should be viewed as provisional, because the numbers do not include the data for Luxembourg.

**Figure 3** Sum of EU Member State aggregated projections compared with EU-27 emission ceilings defined in Annex I and Annex II of the NECD



**Note:** EU-27 WM projections are based on the aggregated WM projections data reported by the individual Member States (excluding data from Luxembourg which were not reported). The emission ceilings shown are the aggregated EU-27 emission ceilings defined in Annex I and Annex II of the NECD. Annex II of the NECD does not define a ceiling for NH<sub>3</sub>.

<sup>(15)</sup> The 2005–2006 changes of emissions in each country are expressed as  $100 * (E_{curr} - E_{prev}) / E_{prev}$  (%), where  $E_{curr}$  and  $E_{prev}$  are current and previous total emissions in the each particular year, respectively. The 1990–2006 changes of emissions in each country are expressed as  $100 * (E_{curr} - E_{1990}) / E_{1990}$  (%), where  $E_{curr}$  and  $E_{1990}$  are current and 1990 total emissions in each particular year, respectively.

<sup>(16)</sup> The relative difference between a) emissions in 2006 and the emission ceilings was estimated as  $100 * (E_{2006} - E_{ceiling}) / E_{ceiling}$  (%), where  $E_{2006}$  and  $E_{ceiling}$  are the 2006 emissions and the 2010 emission ceiling value, respectively; and b) the Member State projected emissions for 2010 and the respective ceilings was estimated as  $100 * (P_{2010} - E_{ceiling}) / E_{ceiling}$  (%), where  $P_{2010}$  is the reported WM projection for 2010 and  $E_{ceiling}$  is the 2010 emission ceiling value.

## 3.2 NO<sub>x</sub>

### 3.2.1 NO<sub>x</sub> emissions

For the EU-27, total aggregated emission totals for NO<sub>x</sub> are given only for the years 2005-06, because not all Member States have reported the whole data time-series<sup>(17)</sup> (Table 7).

The proximity of the Member States to their respective emission ceilings is shown in Figure 4.

It can be seen that in spite of significant decreases of emissions achieved since 1990 (e.g. Estonia — by 58 %, Germany — by 51 %, Italy — by 44 % and Sweden — by 44 %) within the EU-27, 18 Member States report emissions above their ceilings.

### 3.2.2 NO<sub>x</sub> projections

Of the EU-27, only 10 Member States expect to be below their respective emission ceilings by 2010 (Figure 4). Bulgaria, Lithuania and Greece report

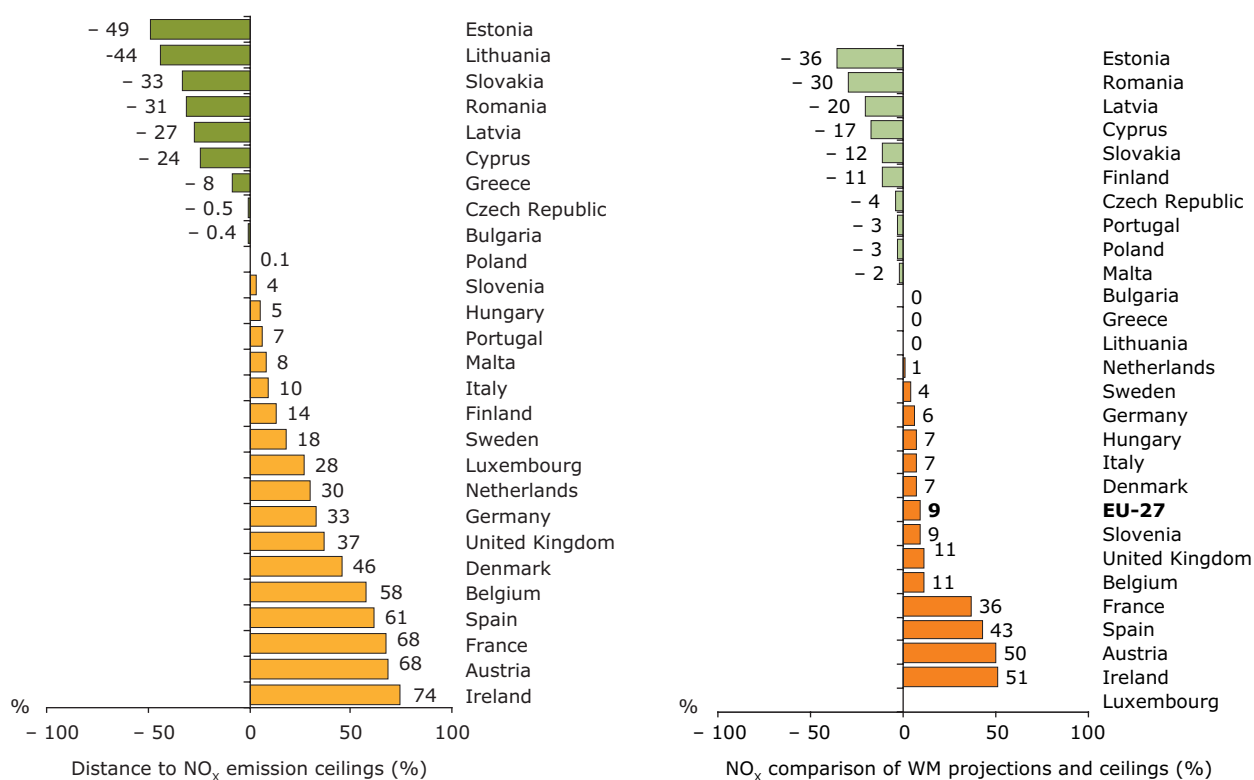
**Table 7** NO<sub>x</sub> emission trend in Gg for EU-27 Member States and change in emissions

NO <sub>x</sub> (Gg)	1990	1995	2000	2001	2002	2003	2004	2005	2006	Change 2005–2006 (%)	Change 1990–2006 (%)	Contribution to EU-27 in 2006 (%)
Austria	200	181	179	180	179	180	177	176	173	- 1	- 13	1.6
Belgium	382	372	329	316	300	298	299	285	278	- 3	- 27	2.5
Bulgaria	NE	NE	NE	NE	NE	NE	NE	233	246	5		2.2
Cyprus	14	18	22	21	22	21	18	17	18	1	21	0.2
Czech Republic	NE	NE	291	291	284	283	286	293	285	- 3		2.6
Denmark	274	266	205	203	199	208	193	184	185	1	- 32	1.7
Estonia	74	38	35	38	40	39	37	32	31	- 5	- 58	0.3
Finland	286	238	210	220	208	219	205	177	193	9	- 33	1.7
France	1 856	1 695	1 559	1 516	1 483	1 450	1 431	1 415	1 358	- 4	- 27	12.3
Germany	2 862	2 132	1 815	1 735	1 640	1 580	1 532	1 447	1 394	- 4	- 51	12.6
Greece	300	321	330	344	341	343	317	332	316	- 5	5	2.9
Hungary	238	NE	186	NE	NE	180	185	203	208	2	- 13	1.9
Ireland	130	130	126	128	120	116	115	117	113	- 3	- 13	1.0
Italy	1 947	1 808	1 378	1 367	1 276	1 245	1 173	1 114	1 087	- 2	- 44	9.8
Latvia	67	40	37	38	38	40	40	41	44	9	- 34	0.4
Lithuania	NE	NE	NE	NE	51	53	55	58	61	6		0.6
Luxembourg	22	20	17	16	16	16	15	14	14	1	- 38	0.1
Malta	11	12	8.7	9.3	9.4	9.7	9.1	9.0	8.6	- 4	- 18	0.1
Netherlands	NE	NE	NE	420	396	393	379	351	337	- 4		3.0
Poland	NE	NE	NE	NE	NE	808	804	811	879	8		7.9
Portugal	244	274	284	285	293	270	271	278	267	- 4	9	2.4
Romania	NE	NE	296	NE	NE	NE	NE	303	301	- 1		2.7
Slovakia	NE	NE	NE	NE	101	98	98	98	87	- 12		0.8
Slovenia	NE	NE	NE	NE	58	56	58	47	47	- 0.4		0.4
Spain	1 179	1 259	1 352	1 334	1 387	1 382	1 412	1 409	1 365	- 3	16	12.3
Sweden	314	280	220	209	204	198	188	181	175	- 3	- 44	1.6
United Kingdom	NE	NE	1 512	1 828	1 715	1 721	1 659	1 619	1 595	- 2		14.4
<b>EU-27</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>11 244</b>	<b>11 064</b>	<b>- 2</b>	<b>NE</b>	<b>100</b>

**Note:** NE = not estimated/provided.

<sup>(17)</sup> As noted previously, the NECD does not require the reporting of emissions from 1990, however, MS are encouraged to do so to enable an improved analysis of the emission trends.

**Figure 4 Proximity to NO<sub>x</sub> emission ceilings for year 2006 (left) and comparison of WM projections reported by Member States with their respective ceilings (right)**



**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

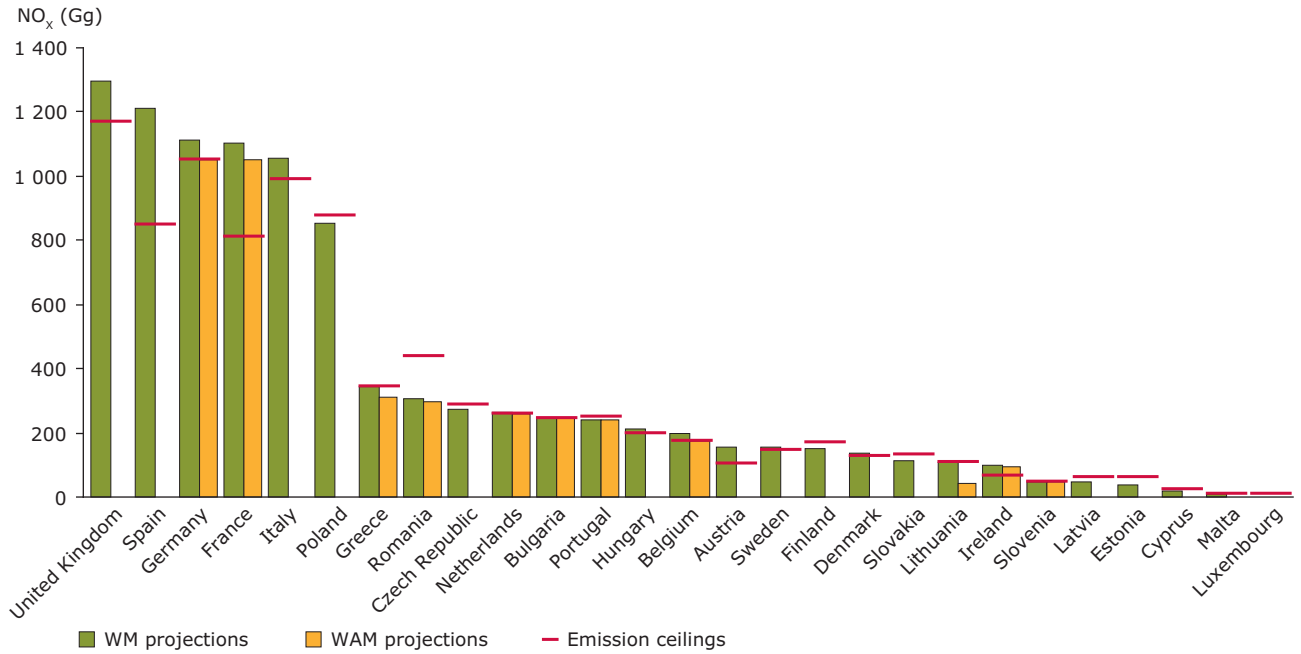
WM projections which meet their ceilings exactly. Four countries (France, Spain, Austria and Ireland) submitted WM projections which are more than 35% above the ceilings. WM projections submitted in 2007 show that the shortfall to reach the NECD ceiling in absolute values is biggest for Spain – 364 Gg, France – 295 Gg, and the United Kingdom – 127 Gg (Figure 5).

The EU-27 projection indicates that it will be 9% above the Annex I aggregate emission ceiling,

calculated on the basis of the individual Member State ceilings defined in the NECD, and 20% – above the Annex II ceiling of the NECD.

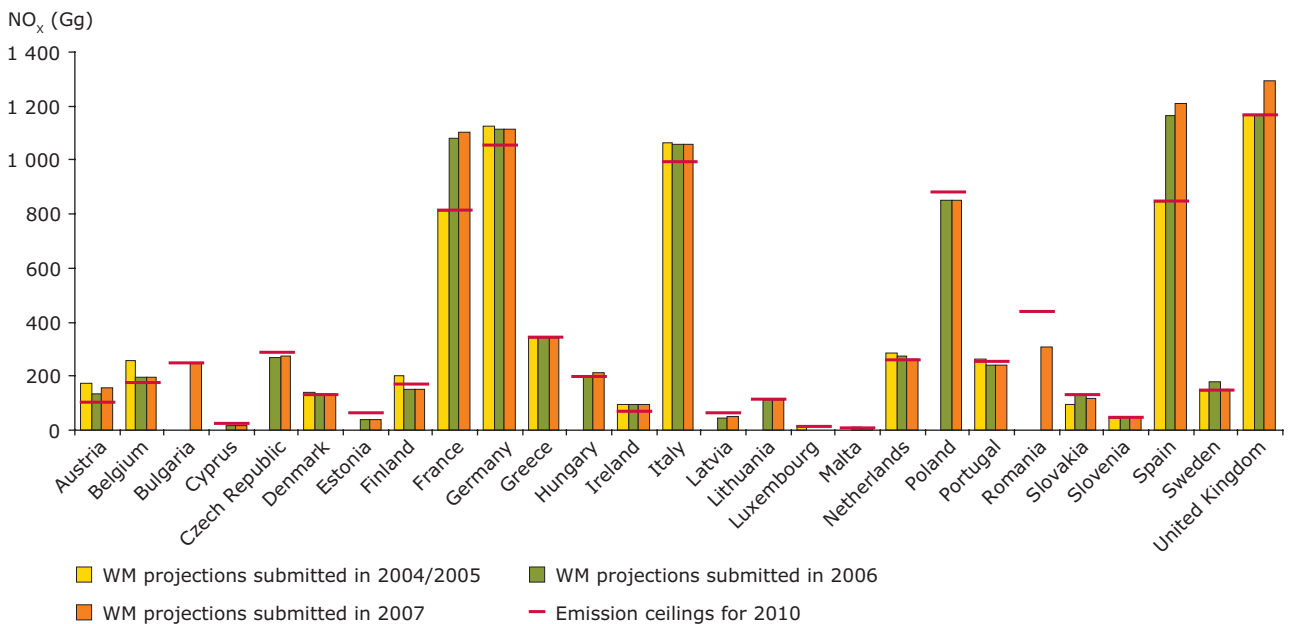
A comparison of NO<sub>x</sub> projections (WM) submitted in 2005, 2006 and 2007 (Figure 6) shows considerable changes in the projections data reported by Belgium, Finland, France, Spain and the United Kingdom.

**Figure 5 Comparison of 2010 NO<sub>x</sub> projections and ceilings to be attained by 2010**



**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

**Figure 6 Comparison of NO<sub>x</sub> projections (WM) as submitted in 2005, 2006 and 2007 and ceilings to be attained by 2010**



**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

### 3.3 NMVOC

#### 3.3.1 NMVOC emissions

Total trends and values for NMVOC can only be given across the EU-27 for the years 2005–2006, because not all Member States have reported over the whole time-series (Table 8).

Figure 7 illustrates how close various Member States are to their respective emission ceilings. Within the EU-27, 12 Member States have already reached their ceilings; whilst all other countries are above. It can be seen that significant decreases of emissions (exceeding 40 % since 1990) have been achieved by 10 Member States out of 18 which reported data over these years (Table 8).

#### 3.3.2 NMVOC projections

Amongst the EU-27 Member States, WM projected emissions from Denmark, France, Poland, Portugal

and Spain estimate these countries will all be above their NMVOC emission ceilings by 2010 (Figure 7). Bulgaria, Finland, Greece, Ireland and Lithuania project that they will meet their ceilings exactly. France plans to reach its ceiling using additional measures. The shortfall to reach the NECD ceiling in absolute values is largest for Poland (140 Gg) and Spain (177 Gg) (Figure 8).

The aggregated EU-27 WM projections are estimated to be 9 % below the aggregated emission ceiling (calculated on the basis of the individual Member State ceilings from the NECD) for 2010 but still, 6 % above the EU-27 ceiling (as shown in Annex II).

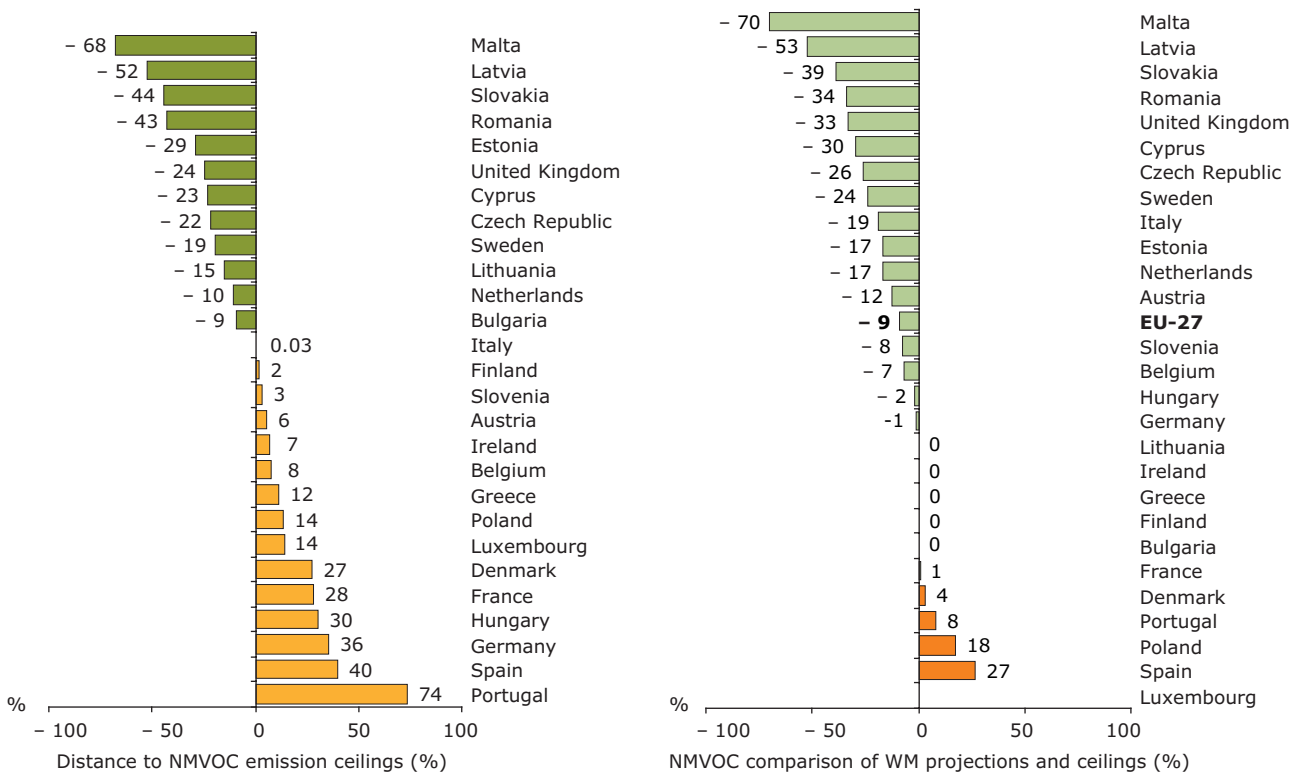
The comparison of NMVOC projections (WM) as submitted in 2005, 2006 and 2007 show variability almost in all Member States, but largest – in Germany, Italy, Poland, Spain, Sweden and the United Kingdom (Figure 9).

**Table 8 NMVOC emission trends (Gg) and changes (%) for the EU-27 Member States**

NMVOC (Gg)	1990	1995	2000	2001	2002	2003	2004	2005	2006	Change 2005–2006 (%)	Change 1990–2006 (%)	Contribution to EU-27 in 2006 (%)
Austria	284	231	177	187	186	179	172	159	168	5	- 41	1.8
Belgium	359	311	245	250	237	231	205	153	150	- 2	- 58	1.6
Bulgaria	NE	NE	NE	NE	NE	NE	NE	147	159	8		1.7
Cyprus	14	15	16	16	16	16	12	11	11	- 7	- 22	0.1
Czech Republic	NE	NE	213	204	197	193	192	176	172	- 2		1.8
Denmark	170	159	127	120	118	113	114	114	108	- 5	- 36	1.2
Estonia	70	46	41	34	38	40	40	36	35	- 5	- 50	0.4
Finland	227	186	160	157	152	145	140	131	132	1	- 42	1.4
France	2 744	2 373	1 935	1 810	1 662	1 606	1 505	1 429	1 345	- 6	- 51	14.4
Germany	3 768	2 094	1 613	1 524	1 451	1 390	1 402	1 385	1 349	- 3	- 64	14.5
Greece	280	305	299	294	289	288	332	289	291	1	4	3.1
Hungary	205	NE	173	NE	NE	155	157	177	179	1	- 13	1.9
Ireland	114	105	76	73	68	64	61	60	59	- 1	- 48	0.6
Italy	2 032	2 023	1 544	1 456	1 346	1 299	1 263	1 207	1 159	- 4	- 43	12.4
Latvia	94	59	56	55	57	60	60	63	65	4	- 31	0.7
Lithuania	NE	NE	NE	NE	72	74	69	84	78	- 7		0.8
Luxembourg	17	17	12	12	12	12	12	11	10	- 5	- 40	0.1
Malta	4.2	6.3	1.8	3.3	3.7	3.6	3.8	3.9	3.8	- 2	- 10	0.0
Netherlands	NE	NE	NE	251	232	224	181	171	166	- 3		1.8
Poland	NE	NE	NE	NE	NE	585	896	885	911	3		9.8
Portugal	307	312	293	295	295	295	297	297	312	5	2	3.4
Romania	NE	NE	362	NE	NE	NE	NE	320	299	- 6		3.2
Slovakia	NE	NE	NE	NE	82	87	88	83	78	- 5		0.8
Slovenia	NE	NE	NE	NE	48	46	46	42	41	- 3		0.4
Spain	1 059	998	1 043	1 015	978	997	985	948	928	- 2	- 10	10.0
Sweden	373	268	220	208	206	207	203	200	195	- 2	- 48	2.1
United Kingdom	NE	NE	1 683	1 237	1 157	1 062	1 001	960	910	- 5		9.8
<b>EU-27</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>9 543</b>	<b>9 313</b>	<b>- 2</b>	<b>NE</b>	<b>100</b>

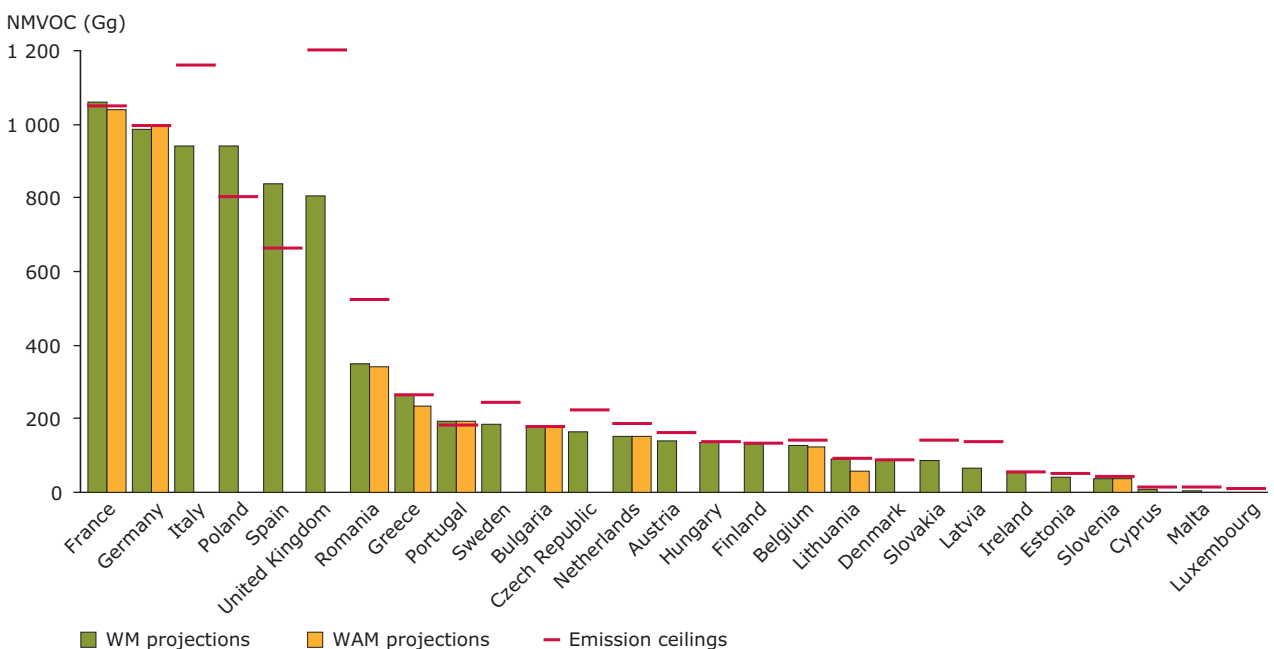
**Note:** NE = not estimated/provided.

**Figure 7 Proximity to NMVOC emission ceilings for year 2006 (left) and comparison of WM projections reported by Member States with their respective ceilings (right)**



**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

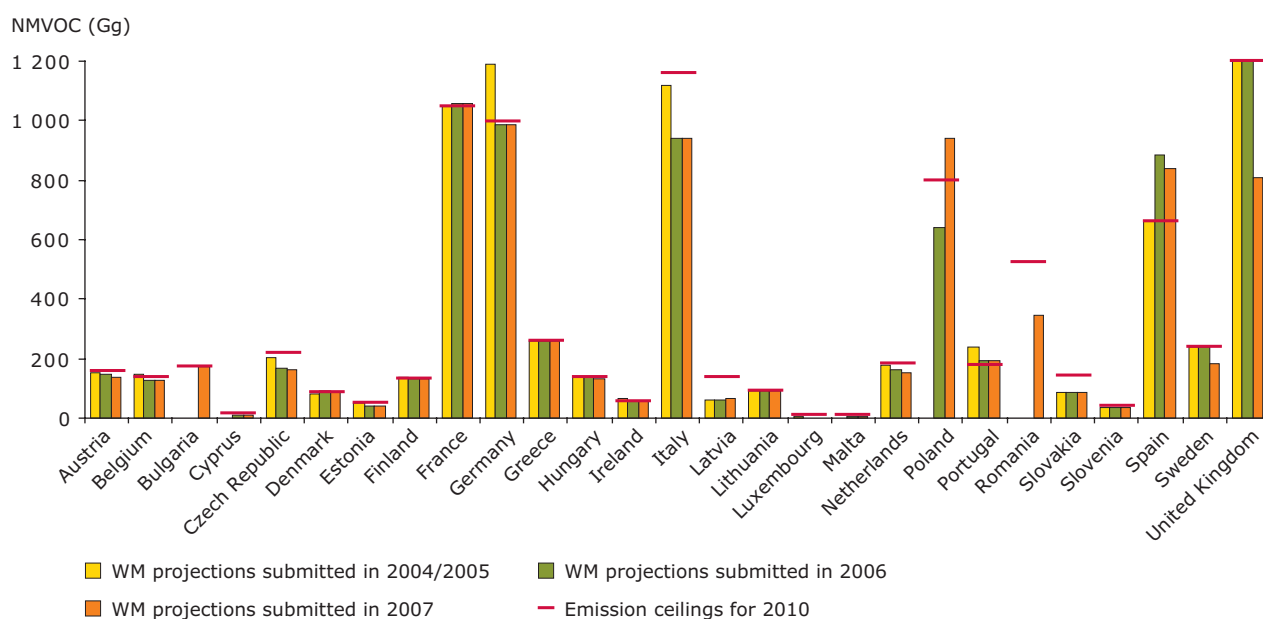
**Figure 8 Comparison of projected NMVOC emissions and ceilings set for 2010**



**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).



**Figure 9 Comparison of NMVOC projections (WM) as submitted in 2005, 2006 and 2007 and ceilings to be attained by 2010**



**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

### 3.4 SO<sub>2</sub>

#### 3.4.1 SO<sub>2</sub> emissions

Total trends and numbers for SO<sub>2</sub> can only be given for the years 2005–2006, because not all Member States have reported over the whole time-series (Table 9). Over these two years, SO<sub>2</sub> emissions in the EU-27 decreased by 2%. Between 1990 and 2006, all Member States — except Greece — reported a decrease in emissions. Reductions greater than 75% are reported by Latvia (97%), Germany (90%), Hungary (88%), Denmark (86%), Luxembourg (83%) and Italy (77%).

Figure 10 shows the current position with respect to emission ceilings for the EU-27. It can be seen that 16 Member States have reported emissions below the level of their respective ceilings, whilst all other Member States presently exceed them.

#### 3.4.2 SO<sub>2</sub> projections

Only the Netherlands does not expect (under the WM scenario) to meet their SO<sub>2</sub> ceilings by 2010, although by implementing additional measures, the Netherlands does anticipate meeting this ceiling (Figure 11). The EU-27 as a whole is projected to be 31% below the aggregate SO<sub>2</sub> ceiling and 27% below the Annex II ceiling (Table 6). Lithuania and Greece both project that they will meet their ceiling exactly.

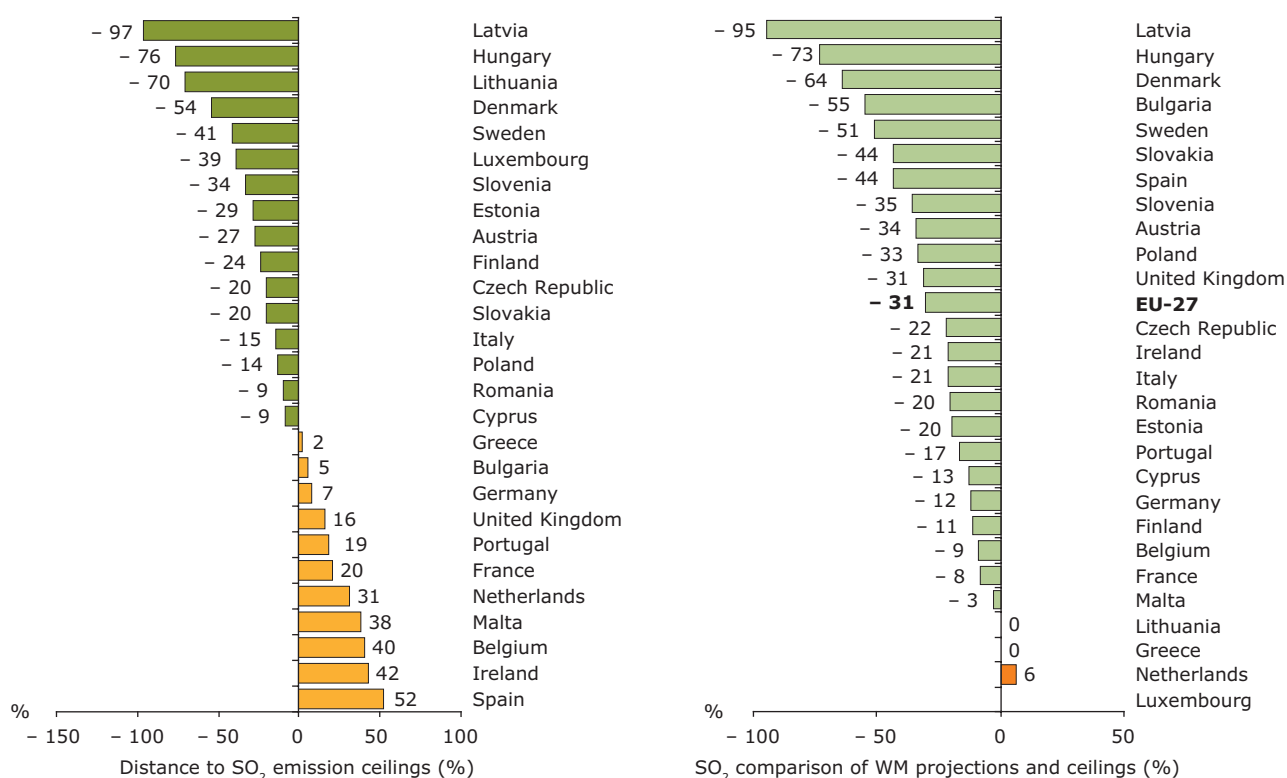
The comparison of SO<sub>2</sub> projections (WM) as submitted in 2005, 2006 and 2007 show the greatest relative variability among all four pollutants. Germany, Greece, Hungary, Italy, Lithuania, Spain and the United Kingdom (Figure 12) display particularly large differences in the projections reported in successive years.

**Table 9 SO<sub>2</sub> emission trends (Gg) and changes (%) for the EU-27 Member States**

SO <sub>2</sub> (Gg)	1990	1995	2000	2001	2002	2003	2004	2005	2006	Change 2005–2006 (%)	Change 1990–2006 (%)	Contribution to EU-27 in 2006 (%)
Austria	75	47	31	32	31	32	27	27	28	7	- 62	0.4
Belgium	363	262	172	169	158	154	157	144	139	- 3	- 62	1.8
Bulgaria	NE	NE	NE	NE	NE	NE	NE	900	877	- 3		11.1
Cyprus	37	44	52	50	51	45	45	42	36	- 16	- 3	0.4
Czech Republic	NE	NE	291	291	284	283	227	218	211	- 3		2.7
Denmark	178	137	29	27	25	32	25	22	25	15	- 86	0.3
Estonia	273	117	96	91	88	101	89	77	71	- 8	- 74	0.9
Finland	260	96	76	85	79	99	84	69	84	22	- 68	1.1
France	1 332	970	615	561	516	509	504	486	452	- 7	- 66	5.7
Germany	5 353	1 724	637	641	601	605	582	574	558	- 3	- 90	7.1
Greece	487	536	493	502	513	545	529	545	536	- 2	10	6.8
Hungary	1 010	NE	487	NE	NE	347	248	129	119	- 8	- 88	1.5
Ireland	183	160	137	129	99	78	72	71	60	- 16	- 67	0.8
Italy	1 795	1 320	753	708	632	528	496	417	406	- 3	- 77	5.1
Latvia	101	48	10	7.9	6.3	4.9	3.9	3.7	3.3	- 10	- 97	0.0
Lithuania	NE	NE	NE	NE	43	43	42	44	43	- 2		0.5
Luxembourg	14	7.6	2.8	2.9	2.2	2.1	2.6	2.5	2.4	- 5	- 83	0.0
Malta	19	30	24	26	25	27	12	12	12	1	- 34	0.2
Netherlands	NE	NE	NE	89	67	65	65	67	65	- 2		0.8
Poland	NE	NE	NE	NE	NE	1 375	1 241	1 222	1 203	- 2		15.2
Portugal	317	332	304	294	294	200	212	215	190	- 12	- 40	2.4
Romania	NE	NE	720	NE	NE	NE	NE	727	832	14		10.5
Slovakia	NE	NE	NE	NE	103	106	97	89	88	- 1		1.1
Slovenia	NE	NE	NE	NE	71	66	54	41	18	- 57		0.2
Spain	2 092	1 734	1 422	1 396	1 499	1 231	1 274	1 228	1 134	- 8	- 41	14.3
Sweden	108	71	46	44	45	45	41	40	39	- 1	- 64	0.5
United Kingdom	NE	NE	1 165	1 119	978	967	813	688	676	- 2		8.5
<b>EU-27</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>8 100</b>	<b>7 907</b>	<b>- 2</b>	<b>NE</b>	<b>100</b>

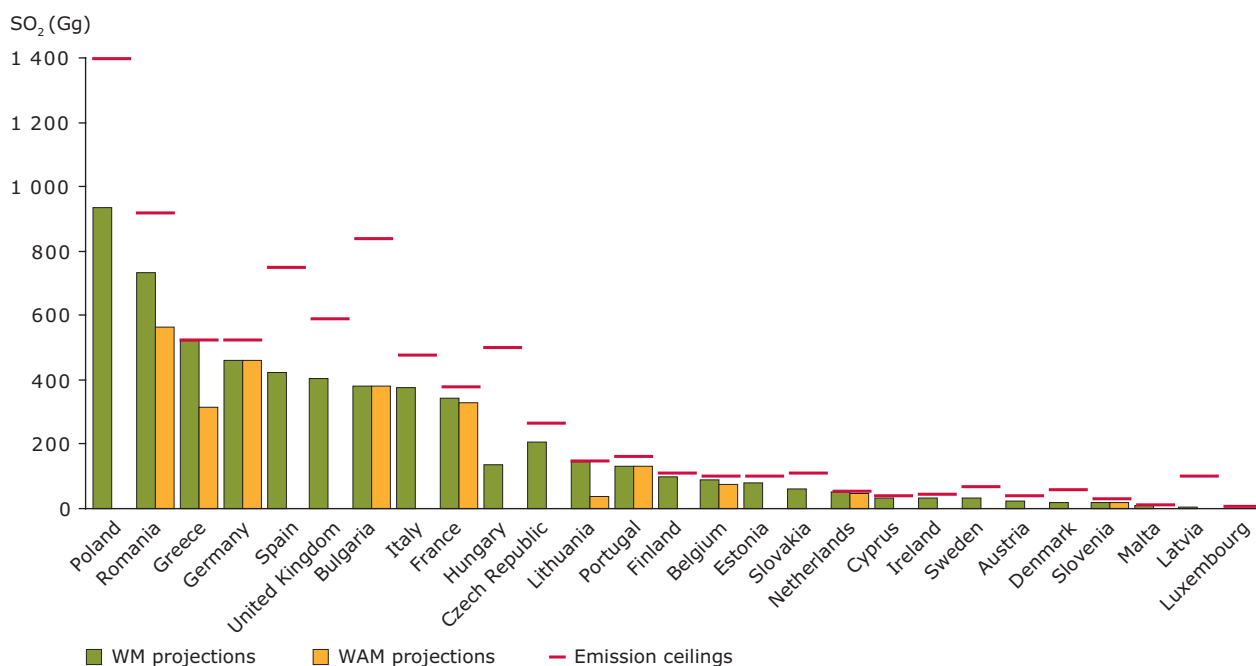
**Note:** NE = not estimated/provided.

**Figure 10 Proximity to SO<sub>2</sub> emission ceilings for year 2006 (left) and comparison of WM projections reported by Member States with their respective ceilings (right)**



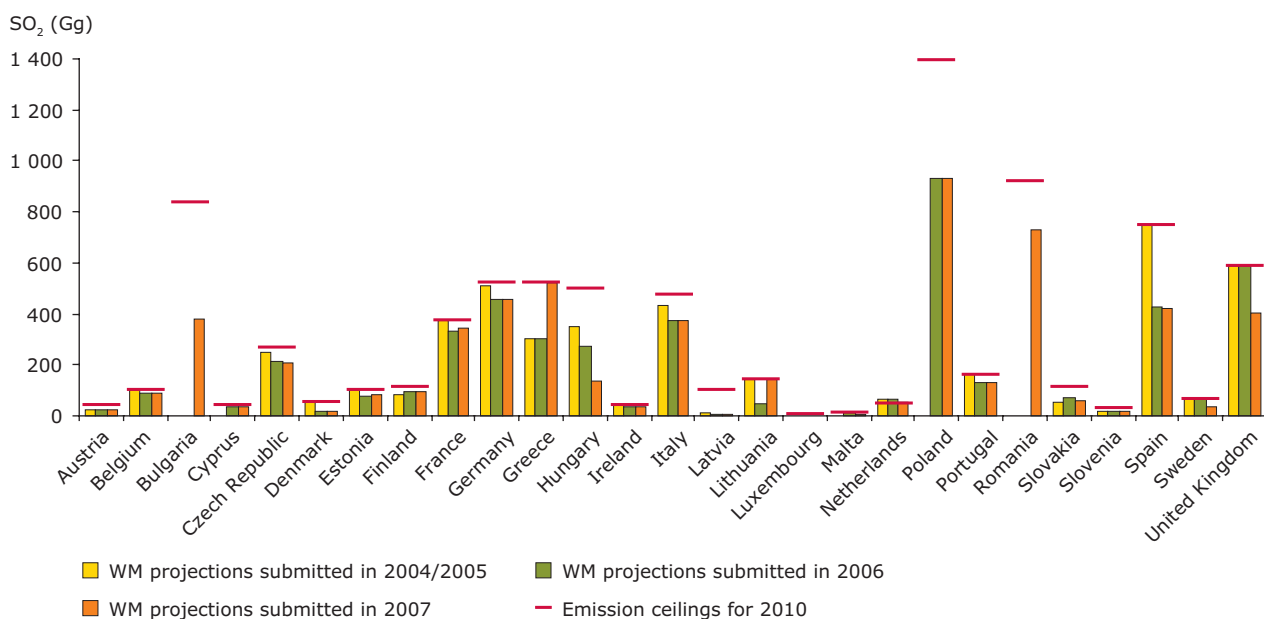
**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

**Figure 11 Comparison of projected SO<sub>2</sub> emissions for 2010 in relation to their 2010 ceilings**



**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

**Figure 12 Comparison of SO<sub>2</sub> projections (WM) as submitted in 2005, 2006 and 2007 and ceilings to be attained by 2010**



**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

### 3.5 NH<sub>3</sub>

#### 3.5.1 NH<sub>3</sub> emissions

It is not possible to give complete trends and total values for NH<sub>3</sub> in the entire EU-27 because not all Member States have reported mandatory data for 2005 and 2006 (Table 10). The reporting of NH<sub>3</sub> emissions by Member States is the most incomplete – compared to the other reported pollutants.

Amongst the 14 Member States which provided emission estimates for years 1990 and 2006, Italy, Spain and Cyprus report increased emissions, whilst all other Member States have reported decreases. Greece did not quantify emissions in 2003–2006 but informed the European Commission that NH<sub>3</sub> emissions were stabilised after the year 1998.

The proximity to respective emission ceilings amongst the EU-27 is shown in Figure 13. It can be seen that 20 Member States already report emissions below the level of their respective ceilings, while Denmark, Finland, Germany, the Netherlands, Spain and the United Kingdom presently have emissions above their respective ceilings. Greece did not report 2003–06 NH<sub>3</sub> emissions, but have noted that these have 'stabilised since 1998'.

#### 3.5.2 NH<sub>3</sub> projections

Of the EU-27 Member States, only Germany and Spain anticipate exceeding their emission ceilings by 2010. Lithuania, Bulgaria, Finland and Greece provided WM projections, and Germany – WAM projections, which exactly coincide with their

**Table 10 NH<sub>3</sub> emission trend in Gg for EU-27 Member States and change in emissions**

NH <sub>3</sub> (Gg)	1990	1995	2000	2001	2002	2003	2004	2005	2006	Change 2005–2006 (%)	Change 1990–2006 (%)	Contribution to EU-27 in 2006 (%)
Austria	71	76	70	69	67	67	66	65	65	0	- 8	1.7
Belgium	112	103	79	84	82	79	76	74	73	- 1	- 35	1.9
Bulgaria	NE	NE	NE	NE	NE	NE	NE	57	55	- 4		1.4
Cyprus	5	5	5	6	6	6	6	5	5	0	17	0.1
Czech Republic	NE	NE	74	67	65	74	70	66	63	- 4		1.6
Denmark	108	94	90	89	86	82	84	79	75	- 4	- 30	1.9
Estonia	26	12	10	10	10	10	10	9	9	0.2	- 64	0.2
Finland	38	35	33	33	33	33	33	36	36	0	- 5	0.9
France	791	773	797	783	785	758	751	745	740	- 1	- 6	19
Germany	738	631	627	639	627	632	625	620	621	0.2	- 16	16
Greece	79	85	74	74	73	NE	NE	NE	NE			NE
Hungary	124	NE	84	NE	NE	67	76	80	72	- 10	- 42	1.9
Ireland	110	115	121	115	113	112	110	110	110	- 0.4	- 0.02	2.8
Italy	405	417	425	434	435	433	426	413	413	- 0.1	2	10.6
Latvia	47	15	12	14	13	14	14	14	15	1	- 69	0.4
Lithuania	NE	NE	NE	NE	51	34	33	39	35	- 11		0.9
Luxembourg	4.9	4.8	4.7	4.6	4.5	4.4	4.5	4.4	4.3	- 2	- 12	0.1
Malta	NE	NE	0.7	0.9	0.9	0.8	0.9	0.9	0.8	- 10		0.02
Netherlands	NE	NE	NE	142	136	130	134	133	133	0.01		3.4
Poland	NE	NE	NE	NE	NE	323	317	326	287	- 12		7.3
Portugal	71	72	76	75	75	70	71	69	70	3	- 1	1.8
Romania	NE	NE	206	NE	NE	NE	NE	194	187	- 3		4.8
Slovakia	NE	NE	NE	NE	31	29	27	27	27	- 1		0.7
Slovenia	NE	NE	NE	NE	19	19	17	18	19	3		0.5
Spain	339	338	408	409	406	420	422	403	421	4	24	11
Sweden	54	62	56	53	52	53	53	53	52	- 1	- 3	1.3
United Kingdom	NE	NE	297	337	326	316	322	314	314	- 0.03		8.1
<b>EU-27</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>NE</b>	<b>3 955</b>	<b>3 903</b>	<b>- 1.3</b>	<b>NE</b>	<b>100</b>

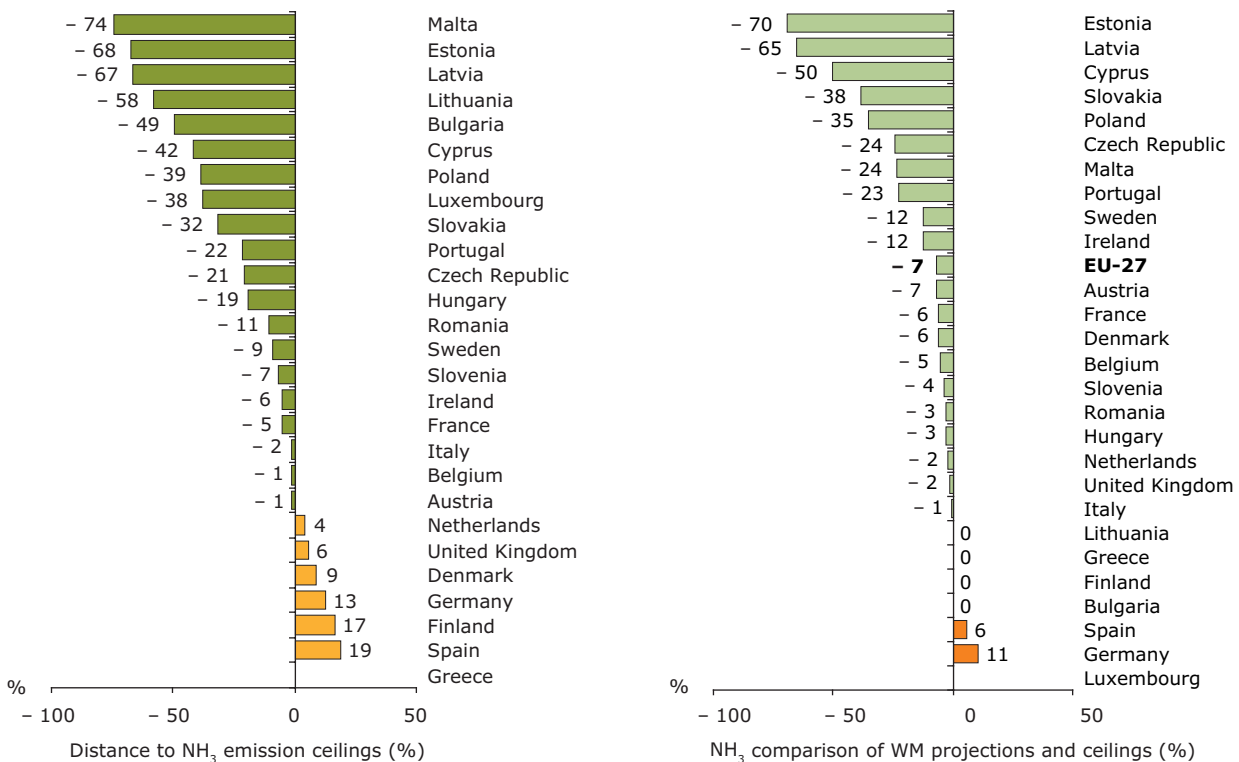
**Note:** NE = not estimated/provided; the aggregated EU-27 emissions for years 2005 and 2006 are without data from Greece.

NH<sub>3</sub> ceiling. The emissions in excess of the NECD emission ceilings in absolute values is largest for Germany (60 Gg) and Spain (20 Gg). Germany has indicated that by implementing additional measures, it anticipates meeting its NH<sub>3</sub> ceiling (Figure 14).

The NH<sub>3</sub> WM projections for the EU-27 are 7% below the aggregated Annex I EU emission ceiling.

The comparison of NH<sub>3</sub> projections (WM) as submitted in 2005, 2006 and 2007 show some notable differences in the data successively reported by Estonia, France and Spain (Figure 15).

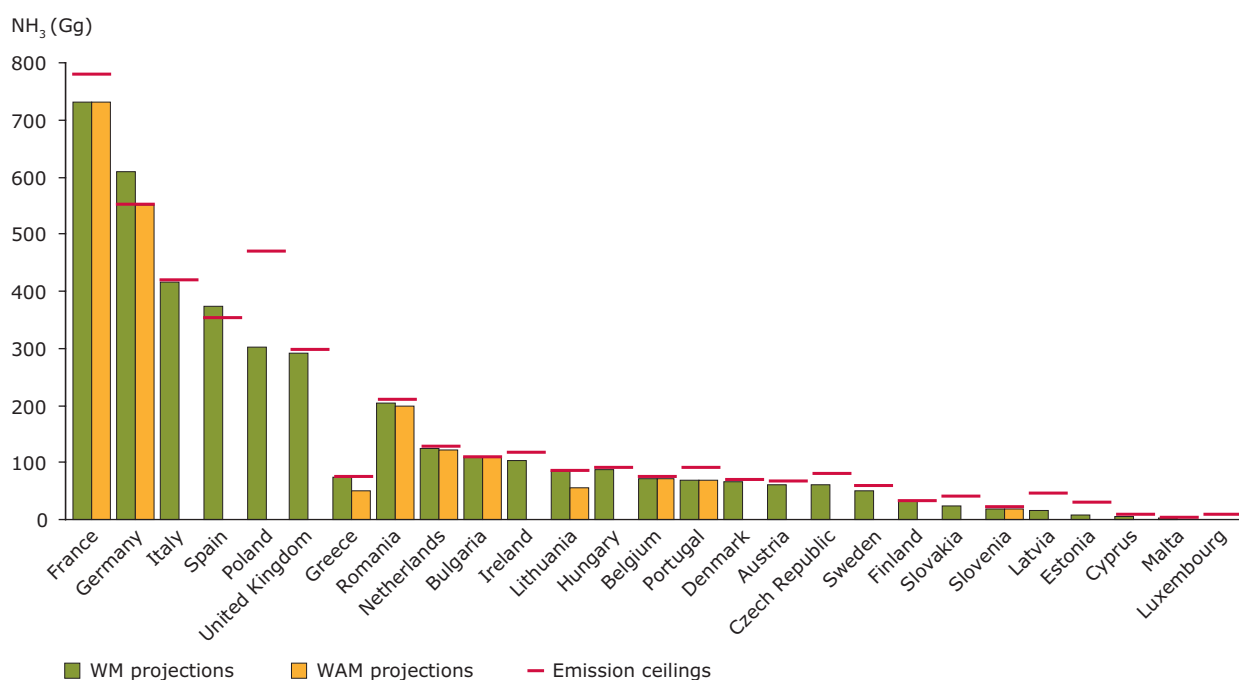
**Figure 13 Proximity to NH<sub>3</sub> emission ceilings for year 2006 (left) and comparison of WM projections reported by Member States with their respective ceilings (right)**



**Note:** Figures are without data from Greece as emissions have not been reported.

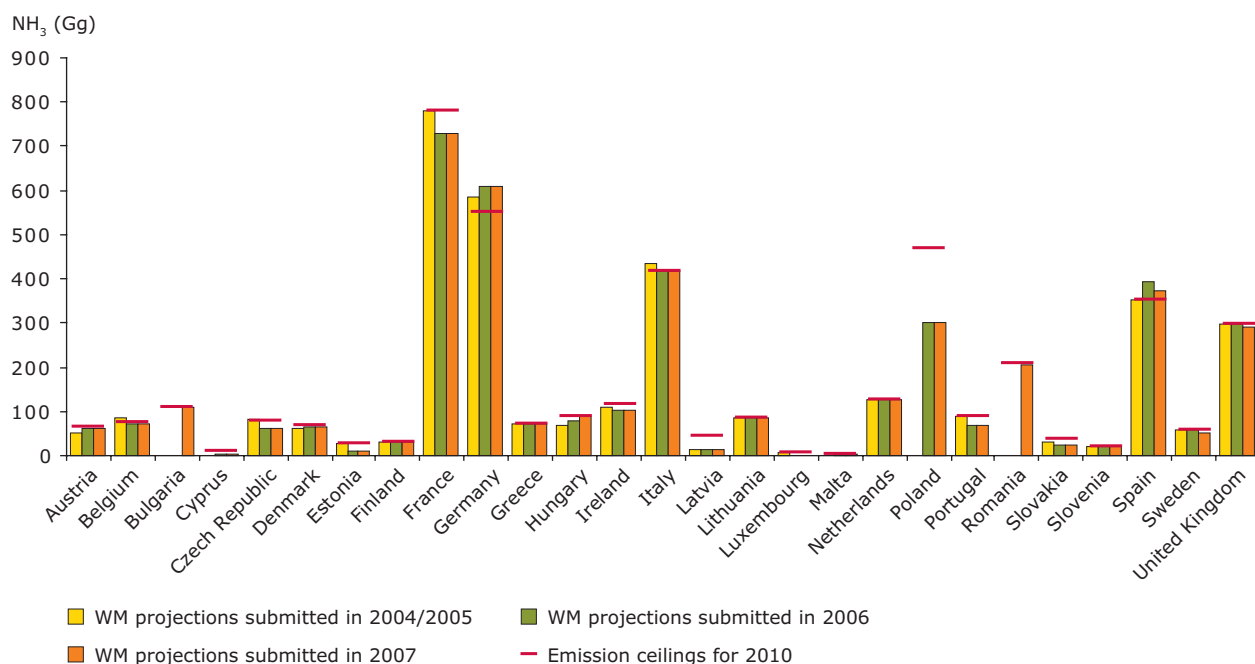
**Projections** are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

**Figure 14 Comparison of projected NH<sub>3</sub> emissions for 2010 and ceilings to be attained by 2010**



**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

**Figure 15 Comparison of NH<sub>3</sub> projections (WM) as submitted in 2005, 2006 and 2007 and ceilings to be attained by 2010**



**Note:** Projections are based on the reported WM projections (without data from Luxembourg as projections have not been reported).

## 4 Recalculations

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The differences between data reported by Member States in 2007 and the data reported under the NECD in 2006 are presented in the tables below. A dash indicates that one of the two submissions did not contain any data and '0' indicates that recalculations were smaller than 0.5 Gg.

In order to correctly evaluate the officially reported emission data it is essential to identify inventory recalculations and to understand their origin. This is especially true in the case when emission ceilings are expressed in absolute terms (as in the NECD), and not as percentage reduction targets (as in the Kyoto Protocol for greenhouse gases). From a country perspective, it is considered good practice, in order to provide comparable and consistent data, to recalculate the whole time-series when new information (i.e. activity or emission factor data) becomes available. The magnitude of recalculations also provides some indication of the general uncertainty of the emissions. However, as the Member States are not formally required to provide any explanatory information as to why recalculations have occurred, it is often not clear why they have reported different numbers. However, it is noted that in some instances (as encouraged by the European Commission), Member

States have submitted an Informative Inventory Report together with their emission inventory data. Details of recalculations performed should be explained within these inventory reports.

In the following tables, a negative number indicates that the emissions reported for the respective year in the 2007 reporting round are lower than those previously reported. Conversely, a positive number indicates that the recalculation has led to an increase in the reported emissions.

### 4.1 NO<sub>x</sub> recalculations

Major recalculations occurred in Austria, France and Sweden, with a maximum of 209 Gg in France for the year 2005 (Table 11).

### 4.2 NMVOC recalculations

Major recalculations were undertaken by Austria, Belgium, France, Germany, Italy and Spain (Table 12). The highest recalculation occurred in Germany for the year 2005 (132 Gg).



**Table 11 Member States' NO<sub>x</sub> recalculations (Gg) for 1990–2005**

NO <sub>x</sub> (Gg)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Austria	- 21	- 17	- 16	- 15	- 12	- 9	- 6	- 3	0	3	6	7	10	12	15	16
Belgium	0	0	0	0	0	0					0	0	0	0	0	- 8
Bulgaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czech Republic	-	-	-	-	-	-	-	-	-	-	0	0	0	0	8	16
Denmark	5	4	3	6	9	7	6	6	5	6	6	8	7	9	9	10
Estonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finland	-	-	-	-	-	-	-	-	-	-	- 4	5	- 3	0	0	- 2
France	18	16	27	26	30	44	59	83	112	138	146	164	174	192	198	209
Germany	1	2	0	0	1	- 37	- 7	- 14	- 16	- 24	- 3	- 40	- 43	- 46	- 47	3
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	-	-	-	-	-	-	-	-	-	0	-	-	0	0	- 2
Ireland	-	-	-	-	-	-	-	-	-	-	-	5	4	5	6	7
Italy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	- 13
Latvia	1	1	1	- 1	0	0	0	0	0	0	0	0	0	0	0	0
Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0	-	-	-	-	0	-	-	-	-	- 3	-	-	- 2	- 3	- 3
Netherlands	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	- 18
Poland	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Portugal	1	0	0	0	0	0	0	0	0	0	0	0	0	- 1	0	3
Romania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Slovenia	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	- 11
Spain	1	3	3	2	- 1	- 1	- 2	0	- 1	- 3	- 2	- 1	- 4	- 1	- 2	3
Sweden	0	0	0	0	0	0	0	0	0	0	- 11	- 14	- 15	- 18	- 21	- 24
United Kingdom	-	-	-	-	-	-	-	-	-	-	0	0	- 6	- 7	- 5	- 7

**Table 12 Member States' NMVOC recalculations (Gg) for 1990–2005**

NMVOC (Gg)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Austria	- 2	3	8	11	12	13	12	11	10	9	9	17	22	20	19	9
Belgium	0	0	0	0	0	0	-	-	-	-	0	0	0	0	0	- 49
Bulgaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czech Republic	-	-	-	-	-	-	-	-	-	-	0	0	0	0	8	- 4
Denmark	3	2	2	4	5	3	3	1	1	0	- 2	- 3	- 2	- 4	- 4	- 5
Estonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finland	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	2
France	- 18	- 21	- 7	- 9	- 1	3	- 18	1	- 3	13	- 2	- 38	- 22	17	- 11	- 11
Germany	156	136	131	130	125	122	123	122	124	120	122	119	116	115	114	132
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	-	-	-	-	-	-	-	-	-	0	-	-	0	0	-
Ireland	-	-	-	-	-	-	-	-	-	-	-	1	1	0	- 1	0
Italy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	- 27
Latvia	- 1	- 2	- 2	- 2	- 2	- 2	- 2	- 2	- 3	- 3	- 3	- 3	- 3	- 1	- 2	- 1
Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0	-	-	-	-	0	-	-	-	-	- 6	-	-	- 4	- 1	- 2
Netherlands	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	- 7
Poland	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Portugal	2	3	2	2	2	1	1	- 6	- 7	- 5	- 4	- 3	- 5	- 6	- 4	- 4
Romania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-	-	-	-	5	6	4
Slovenia	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	- 1
Spain	- 74	- 86	- 80	- 90	- 86	- 76	- 66	- 68	- 91	- 91	- 76	- 77	- 99	- 85	- 92	- 104
Sweden	- 1	- 1	- 1	0	0	0	0	0	0	0	0	0	0	2	0	1
United Kingdom	-	-	-	-	-	-	-	-	-	-	0	0	- 2	- 1	- 8	- 17

### 4.3 SO<sub>2</sub> recalculations

Relatively minor recalculations were performed for SO<sub>2</sub> emission data (Table 13). The maximum recalculation occurred in Germany in the year 2005 (36 Gg).

**Table 13 Member States' SO<sub>2</sub> recalculations (Gg) for 1990–2005**

SO <sub>2</sub> (Gg)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Austria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Belgium	0	0	0	0	0	0	-	-	-	-	0	0	0	0	0	-3
Bulgaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czech Republic	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	-2
Denmark	-1	-2	0	0	0	1	1	0	0	0	0	0	-1	-1	0	0
Estonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finland	-	-	-	-	-	-	-	-	-	-	0	0	-4	0	0	1
France	0	0	3	3	3	3	2	2	1	1	-3	8	-4	4	16	21
Germany	4	0	0	0	0	-3	-6	-9	-1	3	18	19	16	10	12	36
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hungary	0	-	-	-	-	-	-	-	-	-	0	-	-	0	0	-28
Ireland	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0
Italy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-33
Latvia	2	1	2	1	1	1	1	1	1	0	0	0	0	0	0	0
Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	0	-	-	-	-	0	-	-	-	-	-10	-	-	-6	-6	-6
Netherlands	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	3
Poland	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Portugal	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	9	0
Romania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Slovenia	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	-1
Spain	1	2	2	1	-2	-1	-2	7	6	6	7	7	6	7	5	3
Sweden	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
United Kingdom	-	-	-	-	-	-	-	-	-	-	0	0	-23	-23	-23	-18

#### 4.4 NH<sub>3</sub> recalculations

No major recalculations were performed for NH<sub>3</sub> emission data (Table 14), only a comparatively moderate maximum recalculation of 10 Gg in France and Spain for the year 2000.

**Table 14 Member States' NH<sub>3</sub> recalculations (Gg) for 1990–2005**

NH <sub>3</sub> (Gg)	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Austria	2	3	4	5	5	5	5	4	4	4	3	3	2	2	2	2
Belgium	0	0	0	0	0	0	-	-	-	-	0	0	0	0	0	-1
Bulgaria	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cyprus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Czech Republic	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	1
Denmark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estonia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Finland	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	3
France	4	4	4	4	3	1	0	0	-1	8	8	8	7	8	8	10
Germany	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Greece	0	0	0	0	0	0	0	0	0	0	0	0	0	-	-	-
Hungary	0	-	-	-	-	-	-	-	-	-	0	-	-	0	0	-
Ireland	-	-	-	-	-	-	-	-	-	-	-	-2	-2	-2	-3	-2
Italy	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-3
Latvia	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lithuania	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
Luxembourg	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Malta	-	-	-	-	-	-	-	-	-	-	-1	-	-	0	0	0
Netherlands	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	-2
Poland	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Portugal	6	1	0	0	0	-1	-1	-1	-1	-1	0	-1	-1	-1	-1	-4
Romania	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Slovakia	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0
Slovenia	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0
Spain	3	3	3	3	3	3	3	4	3	2	3	4	3	5	10	5
Sweden	0	0	0	0	0	0	0	0	0	0	0	-1	-2	0	0	0
United Kingdom	-	-	-	-	-	-	-	-	-	-	0	0	0	2	4	-3

## 5 Conclusions

This section summarises the overall emission trends in the Member States, highlights problems encountered in the process of inventory submissions, and makes suggestions for improvements. The recommendations are directed towards improving the quality of national inventories and projections reported under the NECD. They also aim at ensuring better harmonisation between submitted NECD national programmes and inventories. The objectives to be achieved are:

- *higher quality emission inventories and projections* enabling earlier and more accurate definition of any further emission reduction policies and measures, thus facilitating potentially lower cost for compliance solutions;
- *greater harmonisation of reporting requirements*, thereby reducing the administrative burden and facilitating greater consistency in assumptions and relevant parameters, enabling the Commission and the Member States to learn from each other.

### 5.1 Projected emissions

A detailed presentation of long-term emission trends in the EU-27 remains impossible as long as a number of countries continue to submit incomplete inventories for both the present and previous reporting cycles (see Appendix I, Table A.1).

Trend tables (Tables 7–10) presented in the report indicate that emissions of the NECD pollutants in most of the EU Member States have decreased. A number of countries have already succeeded in reducing emissions — in line with the requirements of the NECD, or are projected to do so before 2010 (see projections in Figures 4, 7, 10 and 13).

- Reaching the NO<sub>x</sub> emission ceiling seems to be the most difficult. Projected emissions for the EU-27 are 9 % above the aggregated ceiling as calculated from the sum of the individual Member States' Annex I ceilings (and being 20 % above the EU-27 Annex II NECD ceiling<sup>(18)</sup>). Only 13 Member States presently estimate that they will reach their emission ceiling by 2010. The shortfall to reach the NECD ceilings in absolute values is largest for Spain (364 Gg), France (295 Gg) and the United Kingdom (127 Gg), and in relative terms for Ireland (whose 2006 NO<sub>x</sub> emissions are 74 % above the national ceiling), Austria (68 %) and France (68 %).
- Progress in reducing NMVOC emissions seems to have been more successful. Even if five Member States, according to their submitted projections, do not meet the ceilings in 2010, NMVOC projections for the EU-27 are 9 % below the aggregated ceiling, but 6 % above the Annex II ceiling; the largest shortfall in absolute values is 177 Gg for Spain and 140 Gg for Poland, and in relative terms for Portugal (whose 2006 NMVOC emissions lie 74 % above the national ceiling), Spain (40 %) and Germany (36 %).
- Only the Netherlands does not expect to meet its SO<sub>2</sub> ceiling in 2010. The EU-27 as a whole is projected to be 31 % below the aggregated ceiling. The Annex II ceiling for SO<sub>2</sub> should also be achieved (projected emissions are 27 % below this Annex II ceiling).
- The NH<sub>3</sub> projections for the EU-27 are 7 % under the aggregated emission ceiling. Nineteen Member States have already reduced ammonia emissions under their ceilings, and the remaining Member States (except Germany and Spain) anticipate reducing emissions — in order to reach their respective ceilings by 2010.

<sup>(18)</sup> The EU-27 ceilings presented in Annex II of the NECD (Table 2) are designed with the aim of the European Community as a whole attaining the interim environmental objectives set out in Article 5 of the NECD.

The 'with measures' (WM) projections data reported in 2005, 2006 and 2007 have changed rather considerably in 12 Member States: France (NO<sub>x</sub> and NH<sub>3</sub>), Spain (NO<sub>x</sub>, SO<sub>2</sub> and NMVOC), Germany (NMVOC and SO<sub>2</sub>), Italy (NMVOC and SO<sub>2</sub>), United Kingdom (NMVOC, SO<sub>2</sub> and NO<sub>x</sub>), Poland (NMVOC), Sweden (NMVOC), Belgium (NO<sub>x</sub>), Finland (NO<sub>x</sub>), Greece (SO<sub>2</sub>), Hungary (SO<sub>2</sub>) and Lithuania (SO<sub>2</sub>) (Figures 6, 9, 12 and 15). In general, the projected NH<sub>3</sub> emissions showed only moderate changes between the submissions performed in 2005, 2006 and 2007.

Based on the WM projection data provided by the Member States (Table 5), it becomes clear that only Bulgaria, Cyprus, Czech Republic, Estonia, Finland, Greece, Latvia, Lithuania, Malta, Romania and Slovakia forecast that they will meet their ceilings for all pollutants. However, the WM projections data reported by a number of Member States (Bulgaria, Finland, Greece, Ireland and Lithuania) are identical to the respective NECD ceilings for at least one of the four NECD pollutants. Therefore, even small increases in the volume of emissions above their 'with measures' forecast would lead to them not meeting their ceilings for these pollutants.

Whilst the projections data reported by the Member States have been assessed against the NECD ceilings by referring to their WM projections, it is recognised that 11<sup>(19)</sup> Member States (Belgium, Bulgaria, France, Germany, Greece, Ireland, Lithuania, Netherlands, Portugal, Romania and Slovenia) are considering implementing 'additional' measures in order to further reduce their emissions before 2010 (i.e. additional to the measures already included in their WM projections). A more detailed analysis of policies and measures reported by the Member States in 2006 is presented in a report analysing the details of national programmes as provided by the Member States (AEA Technology, 2007).

## 5.2 Data reporting issues

### 5.2.1 Timeliness and completeness

The timeliness of Member States' reporting has improved in comparison to the previous NECD reporting cycle. This latest reporting round was the first instance since reporting began under the NECD that all Member States submitted at least some data.

Eighteen Member States provided inventories by the required deadline, compared to 16 in the previous cycle.

Submitted inventories were not always complete (e.g. Greece did not provide the final data for 2005 emissions and did not report NH<sub>3</sub> emissions for either 2005 or 2006). To review the progress in reaching emission ceilings, aggregated EU-27 emissions should be compiled and emission trends evaluated, but there are at present no agreed procedures on how to proceed when data is missing. Without having such procedures in place, it is impossible to compile the aggregated EU-27 emissions if Member States provide incomplete and/or inconsistent data.

### 5.2.2 Consistency and comparability

Nine Member States submitted inventories in a comparable and consistent (NFR) format, using a standard spreadsheet template. The remaining 18 Member States submitted data using a variety of non-standard formats (e.g. modified spreadsheet files, PDF files, etc). Such approaches create processing problems when compiling the EU inventory or checking for consistency and completeness.

It is also not always clear from the submitted inventories how various Member States estimate emissions from combustion of fossil fuels<sup>(20)</sup> (e.g. whether the road transport estimates are based on fuel used or fuel sold). Additional information is therefore required from the Member States in order to determine the basis on which road transport emissions have been calculated. Such information could be included in an Informative Inventory Report were this to become a mandatory part of reporting. Similarly, few Member States report the key socioeconomic assumptions used in the preparation of their projections, despite this being a formal requirement of the NECD.

### 5.2.3 Recalculations

Relatively major recalculations occurred in Austria (NO<sub>x</sub> and NMVOC), France (NO<sub>x</sub>, NMVOC and SO<sub>2</sub>), Sweden (NO<sub>x</sub>), Belgium (NMVOC), Italy (NMVOC and SO<sub>2</sub>), Spain (NMVOC), Germany (NMVOC and SO<sub>2</sub>), Hungary (SO<sub>2</sub>) and United Kingdom (SO<sub>2</sub>). The other countries, in general,

<sup>(19)</sup> WAM projections submitted by Bulgaria, Portugal and Slovenia seem to be identical with WM projections.

<sup>(20)</sup> The Member States have flexibility in selecting whether to report their transport emissions on a basis of fuel used or fuel sold. See Table 4 with the summary of reporting obligations.

reported either no recalculations or only minor ones. It was not possible to present an overall estimate of the recalculation for EU-27, as data for several Member States were missing both in the 2007 and the 2006 submission.

### 5.3 Suggested future improvements

To help improve transparency of the reported NECD data, part of the inventory reporting by the Member States could, in future, involve submission of a short informative report. Such a report should include the explanatory information concerning the reported inventory, for example:

- whether countries report on a basis of fuel used/sold (to prevent double-counting or omissions when compiling the EU-27 inventory);
- all countries should clearly describe how the NECD national totals are reflecting the requirements of Article 4 as related to maritime traffic and aircraft emissions (LTO cycle/cruise);
- Member States such as Portugal, Spain and France should confirm which territory is covered in their submitted inventory <sup>(21)</sup>;

- an overview of recalculations could be made (with regard to the previous year submission) including quantitative information and brief explanations for the recalculations;
- Member States are invited to provide information on their 1990 emissions (national totals as a minimum) so as to enable better evaluation of trends.

The importance of providing inventories in *standardised formats* has been repeatedly stressed by the European Commission and the EEA in their communications with the Member States (e.g. through the Eionet). Although the transfer of reported data into standardised formats for analysis is possible and is already performed by ETC/ACC for some of the submitted data formats, the process is time-consuming and is a potential source of errors. The NECD itself does not presently define a required reporting format for national inventories. A definition of inventory reporting formats should be considered for inclusion into the revised NECD.

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<sup>(21)</sup> In the 2007 reporting cycle, France provided an additional table with national totals excluding overseas areas; Portugal sent an explanatory note saying that Madeira and the Azores are included; Spain provided information that Ceuta and Melilla are included, along with the Peninsula and Balearic Islands, while the Canary Islands are excluded in accordance with Article 2 c.

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# Units and abbreviations

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t	1 tonne (metric) = 1 megagram (Mg) = 10 <sup>6</sup> g
Mg	1 megagram = 10 <sup>6</sup> g = 1 tonne (t)
Gg	1 gigagram = 10 <sup>9</sup> g = 1 kilotonne (kt)
Tg	1 teragram = 10 <sup>12</sup> g = 1 megatonne (Mt)
TJ	1 terajoule
BaU	(projections) business as usual
Cd	cadmium
CDR	EIONET central data repository
CH <sub>4</sub>	methane
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CLRTAP	LRTAP Convention
CLS	current legislation projections
CRP	current reduction projections
CRF	Common reporting format
EC	European Community
EEA	European Environment Agency
Eionet	European environmental information and observation network of the EEA
EMEP	European monitoring evaluation programme
ETC/ACC	European Topic Centre on Air and Climate Change
EU	European Union
HFCs	hydrofluorocarbons
Hg	mercury
HM	heavy metals
LRTAP Convention	Convention on Long-range Transboundary Air Pollution
IEO	interim environmental objective
LTO	landing and take off cycle
MS	Member State
NECD	national emission ceilings directive
NFR	nomenclature for reporting
NH <sub>3</sub>	ammonia
NMVOG	non-methane volatile organic compounds
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
N <sub>2</sub> O	nitrous oxide
Pb	lead
PFCs	perfluorocarbons
PM	particulate matter
POPs	persistent organic pollutants
QA/QC	quality assurance/quality control
SF <sub>6</sub>	sulphur hexafluoride
SO <sub>2</sub>	sulphur dioxide
SO <sub>x</sub>	sulphur oxides
TSP	total suspended particles
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
VOCs	volatile organic compounds (non-methane)
WAM	(projections) with additional measures
WM	(projections) with measures
WOM	(projections) without measures



# Appendix I – data sources

**Table A.1 Overview of emission data sources used in the trend tables in Chapter 3 (status as of 31 July 2008)**

Member State	1990	1995	2000	2001	2002	2003	2004	2005	2006
Austria	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Belgium	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Bulgaria								SUBM07	SUBM07
Cyprus	SUBM06	SUBM06	SUBM06	SUBM06	SUBM06	SUBM06	SUBM06	SUBM07	SUBM07
Czech Republic			SUBM06	SUBM06	SUBM06	SUBM06	SUBM06	SUBM07	SUBM07
Denmark	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Estonia	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Finland	SUBM07	SUBM07	SUBM03	SUBM03	SUBM03	SUBM05	SUBM06	SUBM07	SUBM07
France	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Germany	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Greece	SUBM04	SUBM04	SUBM04	SUBM04	SUBM04	SUBM05	SUBM05	SUBM06	SUBM07
Hungary	PROG05		PROG06			SUBM05	PROG06	SUBM07	SUBM07
Ireland	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Italy	SUBM05	SUBM05	SUBM05	SUBM05	SUBM05	SUBM05	SUBM06	SUBM07	SUBM07
Latvia	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Lithuania					SUBM04	SUBM04	SUBM07	SUBM07	SUBM07
Luxembourg	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Malta	PROG06	PROG06	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Netherlands				SUBM03	SUBM04	SUBM05	SUBM06	SUBM07	SUBM07
Poland						PROG05	PROG06	SUBM06	SUBM07
Portugal	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Romania			PROG07*					SUBM07	SUBM07
Slovakia					SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Slovenia					SUBM05	SUBM05	SUBM06	SUBM07	SUBM07
Spain	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
Sweden	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07
United Kingdom			SUBM03	SUBM06	SUBM07	SUBM07	SUBM07	SUBM07	SUBM07

**Note:** SUBM07 = inventory submission with the reporting deadline on 31 December 2007;  
 SUBM06 = inventory submission with the reporting deadline on 31 December 2006;  
 SUBM05 = inventory submission with the reporting deadline on 31 December 2005;  
 PROG06 = national programme with the reporting deadline on 31 December 2006;  
 PROG07 = national programme with the reporting deadline on 31 December 2007.

**Greece** did not report NH<sub>3</sub> emissions for 2003–2006.

**Finland** submitted for 1990–1999 information on national total emissions only.

**Poland** submitted 2005 emissions only in pdf tables in 2007 reporting round.

**Table A.2 Overview of Member States' emission projections data sources (status as of 31 July 2008)**

Member State	NO <sub>x</sub>	SO <sub>2</sub>	NMVOC	NH <sub>3</sub>	Source
Austria	WM	WM	WM	WM	NFR: Table 2a
Belgium	WM, WAM	WM, WAM	WM, WAM	WM, WAM	Table-Excel
Bulgaria	WM, WAM	WM, WAM	WM, WAM	WM, WAM	NFR: Table 2a
Cyprus	WM	WM	WM	WM	NFR: Table 1a
Czech Republic	WM	WM	WM	WM	Table-Word
Denmark	WM	WM	WM	WM	NFR: Table 2a
Estonia	WM	WM	WM	WM	NFR: Table 1a
Finland	WM	WM	WM	WM	NFR: Table 2a
France *	WM, WAM	WM, WAM	WM, WAM	WM, WAM	National programme, December 2007
Germany	WM, WAM	WM, WAM	WM, WAM	WM, WAM	NFR: Table 2a
Greece	WM, WAM	WM, WAM	WM, WAM	WM, WAM	NFR: Table 2a
Hungary	WM	WM	WM	WM	Table-Excel
Ireland	WM, WAM	WM	WM	WM	National programme, January 2008
Italy	WM	WM	WM	WM	Table-Excel
Latvia	WM	WM	WM	WM	NFR: Table 1a
Lithuania	WM, WAM	WM, WAM	WM, WAM	WM, WAM	NFR: Table 2a
Luxembourg	np	np	np	np	
Malta	WM	WM	WM	WM	Table-Excel
Netherlands	WM, WAM	WM, WAM	WM, WAM	WM, WAM	NFR: Table 2a
Poland	WM	WM	WM	WM	National programme, December 2007
Portugal	WM, WAM	WM, WAM	WM, WAM	WM, WAM	NFR: Table 2a
Romania	BAU, WM, WAM	BAU, WM, WAM	BAU, WM, WAM	BAU, WM, WAM	Table-Excel
Slovakia	WM	WM	WM	WM	NFR: Table 2a
Slovenia	WM, WAM	WM, WAM	WM, WAM	WM, WAM	NFR: Table 2a
Spain	WM	WM	WM	WM	Table-Excel (SNAP 11)
Sweden	WM	WM	WM	WM	NFR: Table 2a
United Kingdom	WM	WM	WM	WM	NFR: Table 2a

**Note:** WM = (projections) with measures;  
WAM = (projections) with additional measures;  
WOM = (projections) without measures;  
np = not provided.

**Definitions** of WM, WAM and WOM projections are provided in Chapter 3 of this report.

\* Additionally to WM and WAM projections, France presented a projection 'Avec Marché de Carbone'.

# Appendix II – status of reporting

**Table A.3 NECD emissions and projections submissions 2007 as of 31 July 2008**

Member State	Submission		Re-submissions	Years covered	Format	SO <sub>2</sub> , NO <sub>x</sub> , NH <sub>3</sub> , NMVOC		Projections table	Updated NECD programmes
	Uploaded to CDR	To the European Commission				2005 final	2006 preliminary		
Austria	20 Dec 2007			1990–2006	NFR	x	x	Sectoral (2010) as pdf file	
Belgium	24 Dec 2007			1990–2006	modified NFR 2004	x	x	Sectoral (2010)	
Bulgaria	19 Dec 2007		11 Feb 2008	2005–2006	modified NFR 2004	x	x	Totals (2010/15/20)	
Cyprus	13 Dec 2007			2005–2006	modified NFR 2004	x	x	Sectoral (2010)	
Czech Republic	1 Feb 2008			2005–2006	NFR modified	x	x	Sectoral (2010)	
Denmark	20 Dec 2007			1980–2006	NFR 2002	x	x	Totals (2010/15/20)	
Estonia	19 Dec 2007			1990–2006	modified NFR 2004	x	x	Sectoral (2010)	19 Dec 2007
Finland	4 Dec 2007		27 Jun 2008	2005–2006	modified NFR 2004; nat.tot	x	x	Totals (2010)	
France	21 Dec 2007			1980–2006	NFR	x	x		21 Dec 2007
Germany	13 Dec 2007		4 Feb 2008	1990–2006	modified NFR 2004	x	x	Totals (2010/15/20)	
Greece	21 Apr 2008			2006	NFR	np	x	Totals (2010)	
Hungary	20 Dec 2007		7 Feb 2008 8 Aug 2008	2005–2006	SNAPS only; NFR	x	x	Totals (2010/15/20)	np
Ireland	4 Jan 2008		31 Jan 2008	1990–2006	NFR 2002	x	x		4 Jan 2008
Italy	21 Jan 2008			2005–2006	NFR	x	x	Sectoral (2010/15/20)	
Latvia	27 Dec 2007		15 Feb 2008	1990–2006	modified NFR 2004	x	x	Sectoral (2010)	
Lithuania	4 Jan 2008		4 Jan 2008 28 Jan 2008	2004–2006	NFR 2004	x	x	Totals (2010)	
Luxembourg	9 Jul 2008			1990–2006	NFR	x	x		np
Malta	23 Jan 2008			2000–2006	modified NFR 2004	x	x	Sectoral (2010)	
Netherlands	20 Dec 2007			2005–2006	modified NFR 2002	x	x	Totals (2010)	
Poland	2 Jan 2008		11 Feb 2008	2005–2006	NFR , pdf tables	x	x		2 Jan 2008
Portugal	28 Dec 2007		22 Feb 2008	1990–2006	NFR 2002	x	x	Totals (2010)	
Romania	27 Dec 2007			2005–2006	modified NFR 2004	x	x	Sectoral (2010)	
Slovakia	17 Dec 2007			2002–2006	modified NFR 2004	x	x	Totals (2010/15/20)	
Slovenia	7 Jan 2008	21 Dec 2007	20 Mar 2008	2005–2006	modified NFR 2004	x	x	Totals (2010/15/20)	20 Mar 2008
Spain	13 Mar 2008			1990–2006	NFR 2002	x	x	Totals (2010)	11 Feb 2008
Sweden	28 Dec 2007			1988–2006	modified NFR 2004	x	x	Totals (2010/15/20)	
United Kingdom	20 Dec 2007	17 Dec 2007		2002–2006	modified NFR 2004	x	x	Totals (2010/15/20)	

**Note:** np = not provided; x = provided.

**NFR** = Nomenclature for reporting — sectoral classification system developed by UNECE/EMEP for the reporting of air emissions.



European Environment Agency

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