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NEC Directive status report 2010

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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Executive summary

This report documents the most recent emissions and projections information provided by the Member States of the European Union under the National Emission Ceilings Directive (NECD) ([1]) at the end of 2010.

The directive requires all 27 Member States to report information annually concerning emissions and projections for four main air pollutants: nitrogen oxides (NO_X), non-methane volatile organic compounds (NMVOCs), sulphur dioxide (SO_2), and ammonia (NH_3). These pollutants harm both human health and the environment by contributing to the formation of ozone and particulate matter and by causing acidification and eutrophication. A summary of the main sources and impacts caused by these air pollutants is provided in the introductory chapter to this report. 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 must be met by 2010 and in years thereafter.

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

Updated data reported by Member States ([2]) shows only 15 Member States anticipate they will have met all four of the pollutant-specific emission ceilings specified in the NECD — with the remaining 12 Member States missing at least one of their respective ceilings (Table ES.1). In the previous reporting round (2009), 14 Member States forecasted that they would meet their ceilings for all pollutants. However, following changes to their reported projections for the year 2010, Malta, Sweden and the United Kingdom now anticipate meeting their emission ceilings for all four pollutants, but Denmark and Greece no longer do.

As noted in last year's report ([3]), for most Member States the 2010 emission ceiling for NO_X remains the most challenging. Ten Member States report that they anticipate missing it, based on reported 'with measures' projections ([4]). The road transport sector contributed around 40 % of total EU-27 NO_X emissions in 2008 ([5]) and, although overall emissions have decreased since 1990, the reduction has not always been as large as originally anticipated. This is partly because the sector has grown more than expected and partly because vehicle emission standards have not always delivered the anticipated level of NO_X reductions. The NECD requires Member States to report emissions in accordance with the methodologies agreed upon under the UNECE LRTAP Convention and as such does not allow for adjustments of inventories if policies are found to be delivering lower reductions than originally anticipated. Four Member States (Germany, Portugal and Spain and now in addition, Denmark) indicate they will miss their NMVOC ceiling and two Member States (Germany and the Netherlands) expect to miss their NH_3 ceiling. All Member States anticipate meeting their SO_2 ceiling.

Some Member States, such as the Netherlands and Slovenia, expect to exceed their respective NO_X ceilings by only small margins (less than 5 %). In contrast, Germany and France expect to exceed

([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]) By 31 December each year, Member States must report to the European Commission and the EEA their emission projections for the year 2010, together with final emission data for the previous year but one, and provisional emission data for the previous year. Thus by 31 December 2010, Member States were obliged to report 2010 'projections' together with final emission data for 2008 and provisional data for 2009. Emission inventory data (both for air pollutants and greenhouse gases) can typically only be compiled and reported by countries with around a 2-year delay. This delay is mainly a result of the time needed for official national and/or trade statistics to become available (typically up to 12 months following a calendar year) together with the time needed for subsequent data processing, calculations and performing quality assurance/quality control checks.

([3]) *NEC Directive status report 2009*, EEA Technical report No 10/2010.

([4]) 'With measures' projections take into account currently implemented and adopted policies and measures.

([5]) *European Union emission inventory report 1990–2008 under the Convention on Long-range Transboundary Air Pollution*, EEA Technical Report No 7/2010.

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

Member State	NO_x	NMVOCs	SO_2	NH_3
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	√	√	√	√
√	**17**	**23**	**27**	**25**
×	**10**	**4**	**0**	**2**
NE	**0**	**0**	**0**	**0**

Notes: '✓' indicates that a Member State anticipates meeting or surpassing its respective emission ceiling on the basis of currently implemented and adopted policies and measures i.e. 'with measures' (WM) projections.

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

'*' indicates that the respective Member State has not revised its projection data for any of the four pollutants compared to the previous (2009) data submission.

'**' indicates that projection data of this Member State are taken from the 2009 reporting round, as no projection data were received in 2010.

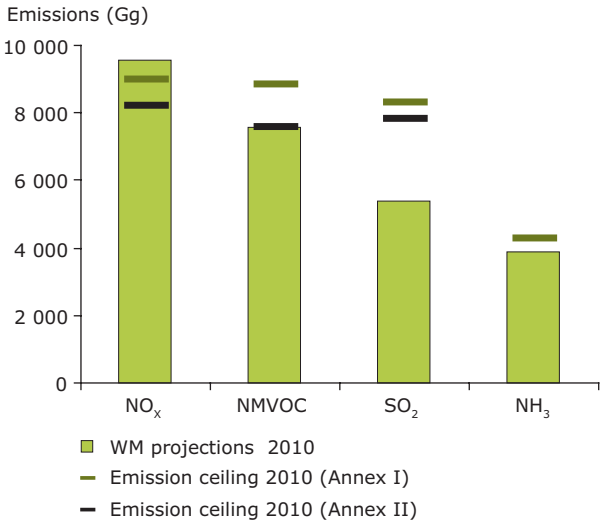
'***' Following finalisation of this report, new projections from Austria, Malta and Spain were received. The comparison provided in the table above takes these updated values into account.

For informative purposes, one Member State, Germany, also reported projections that excluded certain emission source categories that were not included in the original modelling undertaken when the 2010 emission ceilings were agreed. These projections result in lower NO_x and NMVOC emissions for 2010. However, taking these reductions into account, for both pollutants Germany still anticipates missing its respective emission ceilings.

their ceilings by 328 kilotonnes and 275 kilotonnes respectively — equivalent to exceedances of 31 % and 34 %. Austria, while expecting lower surpluses in absolute terms, anticipates exceeding its ceilings by an even larger margin (40 %).

Analysis also shows that, with current measures in place, the summed emissions in the EU-27 are anticipated to be higher than the aggregated 2010 ceiling (Annex I to the NECD ([6])) for NO_X but lower than the ceilings for the remaining pollutants (SO_2, NMVOC and NH_3) (Figure ES.1). Similarly, of the three more strict Annex II emission ceilings which are designed with the aim of broadly meeting the interim environmental objectives as set out in Article 5 of the NECD, only the NO_X ceiling is projected to be missed. NMVOC emissions are projected to be only marginally below the Annex II ceiling.

Figure ES.1 Comparison of aggregated EU-27 WM emission projections and ceilings reported in 2010



Note: EU-27 WM projections are aggregates of the projections reported by individual Member States. 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. For Hungary, Malta, Romania and Spain projection data submitted in 2009 were used, as these countries did not reported any projection data in the year 2010.

Specifically for the four NECD pollutants:

- projected EU-27 NO_X emissions ([7]) are 6 % above the aggregate emission ceiling given in Annex I (calculated on the basis of the individual Member State ceilings defined in the NECD), and 17 % above the stricter Annex II ceiling of the NECD for the EU-27 as a whole;
- NMVOC projections for the EU-27 are 14 % below the aggregated emission ceiling given in Annex I for 2010, and are marginally below the Annex II ceiling;
- the EU-27 is projected to be 35 % below the Annex I SO_2 ceiling and 31 % below the Annex II SO_2 ceiling;
- the NH_3 WM projections are 9 % below the EU-27 Annex I emission ceiling; there is no separate ceiling for NH_3 defined in Annex II to the NECD.

Completeness of data reporting

a) Submissions

Only twenty-four Member States provided the mandatory information on final emissions for the year 2008 (Hungary, Luxembourg and Malta did not), and 26 Member States provided preliminary emission data for 2009 (Malta did not) in the latest (2010) reporting round as required by the directive ([8]). The total for the EU-27 for 2009 was thus calculated excluding data from Malta.

In terms of the reporting of 'projections' or emission estimates for the year 2010, only 23 Member States provided the mandatory information — Hungary, Malta, Romania and Spain did not report this data. Of the 23 Member States, seven Member States have not revised emission projections for any of the four NEC pollutants as compared to their previous submission in 2009. To enable the calculation of an EU-27 total for 2010 projection data submitted in last year's reporting round were taken for the four Member States that did not provide projection data.

([6]) 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.

([7]) EU-27 WM projections are based on the aggregated WM projection data reported by individual Member States. For Hungary, Malta, Romania and Spain, projection data submitted in 2009 were used, as these countries did not report any projection data in the year 2010.

([8]) Twenty-four of the 27 EU Member States reported their national inventories of NO_X, NMVOC, SO_2 and NH_3 by the required date of 31 December 2010, while two of the remaining Member States reported data after this deadline. Malta has not sent an NEC submission. Thirteen Member States subsequently provided additional or revised data between 24 December 2010 and 4 April 2011.

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 analysis was performed for this year's report in order to assess the number of Member States that reported emissions from selected 'new' pollutant/source category combinations. These combinations were:

i) NO_X and NMVOC emissions from the Agriculture sector; and
ii) NMVOC emissions from the 'Food and drink' sector.

For those Member States that reported emissions, the magnitude of these compared to the national totals and national emissions ceilings was further assessed:

- NMVOC emissions from the Agriculture sector: 16 Member States reported emissions for the year 2009. The reported emissions as a fraction of the total emissions were sometimes significant i.e. (Cyprus (21.5 %), Germany (19.9 %), Bulgaria (19.7 %), Romania (16.6 %) and Estonia (10.0 %)).

- NO_X emissions from the Agriculture sector: 13 Member States reported 2009 emission data for this source category. Emissions of NO_X in this sector corresponded to a 10.5 % and 4 % share of the national total emissions for Germany and Austria respectively. In other Member States NO_X emissions from Agriculture comprised only a relatively small share (below 2.1 %) of total NO_X emissions in 2009.

- NMVOC emissions from the Food and drink sector: Reporting was more complete than for the previous instances, with 23 Member States reporting emission data for 2009. Only Cyprus, Ireland, Luxembourg and Malta did not report emissions from this sector. The share of national total NMVOC emissions that was attributed to 'Food and drink' was between 9.1 % and 12.9 % for Denmark, Lithuania and the United Kingdom. In other Member States the emissions corresponded to around 6 % of the total NMVOC emissions for 2009.

The analysis demonstrates that incomplete reporting, coupled with the apparent significant contribution of certain new source categories to the national total in those Member States where data is available, means that emissions are likely to be underestimated in a number of Member States, and significantly so in some instances.

c) 'Not estimated' emissions

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, when, for example, it is deemed costly to develop a specific estimation methodology compared with improving estimates for more significant sources.

Certain Member States used the notation key 'NE' for a considerable number of source categories. Spain, for example, reported 'NE' for 39 (of around 100) source categories of NH_3. In contrast, a number of Member States used 'NE' for only a limited number of source categories (or for no source category at all).

A simple assessment was also made of the magnitude of the possible underestimation in national emission inventories that may occur due to the use of the notation key 'NE' by Member States. For almost all Member States, the addition of the potential underestimate to their reported 2009 national totals does not change whether they will exceed their respective national ceilings or not. Only for Italy (NO_X) does the addition of the underestimation increase the 2009 emissions above the level of the respective 2010 ceiling.

Member States are encouraged to review the source categories they report as 'NE' and in future provide estimates, especially where these sources may add significantly to the currently reported national totals.

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

For comparison, an overview of the progress in the non-EU EEA member countries in meeting their respective 2010 emission ceilings set under the UNECE (United Nations Economic Commission for Europe) Long-range Transboundary Air Pollution (LRTAP) Convention's Gothenburg Protocol is shown in Table ES.2. Each of these countries projects to miss at least one of their four emission ceilings, although only for Norway (NO_X) is a sizeable exceedance (17 %) of the ceiling projected to occur in 2010; for the other countries and pollutants the projected exceedances are small.

Effects of the economic recession on emission data and reported projections for 2010

Reduced rates of economic activity occurring as a result of the financial economic recession are anticipated to have caused emissions in certain sectors to decrease in a number of Member States, particularly for 2009 and 2010. Only limited information on the assumptions used when developing projections was provided by Member States. Only Germany has clearly stated in their submission that its updated projections for 2010 take into account the 2009 economic crisis. For the other Member States it is not clear whether impacts arising from the recession are included or not.

Table ES.2 Overview of 'with measures' (WM) projections reported by non-EU countries

Country	NO_x	NMVOC	SO_2	NH_3
Liechtenstein	√	√	√	x
Norway	x	√	x	√
Switzerland	√	√	√	x

Note: Projections for Liechtenstein, Norway and Switzerland are the latest reported projections 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.

Almost all Member States that reported data for the years 2008 and 2009 reported emission reductions for all pollutants. For these Member States, the annual emission reduction observed for NO_X, NMVOC and SO_2 between these two years generally appears larger than that noted in earlier NECD status reports. One reason for this is the lower rates of activity in 2009 caused by the economic recession which has subsequently led to a general decrease of emissions.

Past emission trends

Under the NECD, Member States must formally submit only two years of emission data ([2]). This therefore hampers any reliable assessment of long-term emission trends (either within individual Member States or for the EU-27 as a whole) on the basis of data submitted under the NECD. Nevertheless, several Member States do submit updated emission data for all years back to 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. Several Member States have already succeeded in reducing emissions to meet the requirements of the NECD or, as noted earlier, are projected to do so before 2010. A more complete picture of past emission trends in the European Union will be provided in mid-2011 by the European Environment Agency in the annual report 'European Union emission report under the UNECE Convention on Long-range Transboundary Air Pollution' (*in preparation*).

Transparency of reported information

Just 13 Member States (Austria, Estonia, Finland, Greece, Ireland, Latvia, Lithuania, the Netherlands, Poland, Portugal, Slovakia, Slovenia and the United Kingdom) reported key socioeconomic data used in preparing their projections, despite this being a formal requirement of the NECD.

Providing inventory reports or additional explanatory information that describes the methods and sources of the reported data is not mandatory under the NECD, meaning that the transparency of submitted data remains rather limited. Nevertheless, nine Member States (Austria, Finland, Germany, Latvia, Poland, Portugal, Slovakia, Spain and Sweden) voluntarily submitted an inventory report together with their NECD inventories.

Additional information

Data described in this report are made available through an online data viewer of the EEA's data service ([9]) and in an accompanying file to this report (Annex 1).

Individual fact sheets for each Member State are also available on the EEA's website ([10]) which provide additional analysis of various parameters such as emissions per GDP, emissions per capita, and current and projected progress towards the respective emission ceilings for each pollutant.

([9]) EEA air pollutant emissions data viewer (NEC Directive): http://dataservice.eea.europa.eu/PivotApp/pivot.aspx?pivotid=468.
([10]) http://www.eea.europa.eu/themes/air/air-pollutant-emissions-country-factsheets.

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) ([11]) highlights the importance of reporting air pollutant emission data for assessing progress in reducing air pollution in the European Union region and for ascertaining the compliance of the Member States with their commitments.

This report provides an overview of emission and projection data submitted by Member States under the NECD. It also presents an analysis of the distance to emission ceilings of nitrogen oxides (NO_X), non-methane volatile organic compounds (NMVOCs) ([12]), sulphur dioxide (SO_2), and ammonia (NH_3) emissions for the year 2009 and 2010. A summary of the main sources and impacts caused by these air pollutants is provided in Box 1.1. The report was prepared on behalf of the European Environment Agency (EEA) by its European Topic Centre for Air pollution and Climate change mitigation (ETC/ACM).

Throughout this report, the term 'European Union' refers to the 27 Member States as of 31 December 2010: 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.

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. Member States shall accordingly prepare and annually update national total emissions estimates and emission projections for 2010 for the pollutants NO_X, NMVOC, SO_2, and NH_3. In addition, by 31 December each year, the Member States shall report to the European Commission and the EEA these national emission inventories and emission projections; final emission data should be submitted for the previous year but one, and provisional emission data for the previous year. Anticipated significant changes in the geographical distribution of national emissions shall also be indicated.

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 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).

([11]) 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 by Council Directive 2006/105/EC of 20 November 2006 (OJ L 363, 20.12.2006, p. 368) and 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 L 236, 23.9.2003 p. 33). A consolidated version of the NECD is available at: http://ec.europa.eu/environment/air/pdf/nec_eu_27.pdf (accessed 15 April 2011).

([12]) The NECD defines VOCs as being non-methane volatile organic compounds (NMVOC).

Box 1.1 The main air pollutants and their effects on human health and the environment

Nitrogen oxides (NO_x)
Nitrogen oxides (NO_x) are emitted during fuel combustion, such as by industrial facilities and the road transport sector. As with SO_2, NO_x contributes to acid deposition but also to eutrophication. Of the chemical species that comprise NO_x, it is NO_2 that is associated with adverse affects on health, as high concentrations cause inflammation of the airways and reduced lung function. NO_x also contributes to the formation of secondary inorganic particulate matter and tropospheric O_3 (see below).

Ammonia (NH_3)
Ammonia (NH_3), like NO_x, contributes to both eutrophication and acidification. The vast majority of NH_3 emissions — around 94% in Europe — come from the agricultural sector, from activities such as manure storage, slurry spreading and the use of synthetic nitrogenous fertilisers.

Non-methane volatile organic compounds (NMVOCs)
NMVOCs, important O_3 precursors, are emitted from a large number of sources including paint application, road transport, dry-cleaning and other solvent uses. Certain NMVOC species, such as benzene (C_6H_6) and 1,3-butadiene, are directly hazardous to human health. Biogenic NMVOCs are emitted by vegetation, with amounts dependent on the species and on temperature.

Sulphur dioxide (SO_2)
Sulphur dioxide (SO_2) is emitted when fuels containing sulphur are burned. It contributes to acid deposition, the impacts of which can be significant, including adverse effects on aquatic ecosystems in rivers and lakes, and damage to forests.

Tropospheric or ground-level ozone (O_3)
Ozone (O_3) is a secondary pollutant formed in the troposphere, the lower part of the atmosphere, from complex photochemical reactions following emissions of precursor gases such as NO_x and NMVOCs. At the continental scale, methane (CH_4) and carbon monoxide (CO) also play a role in ozone formation. Ozone is a powerful and aggressive oxidising agent, elevated levels of which cause respiratory and cardiovascular health problems and lead to premature mortality. High levels of O_3 can also damage plants, leading to reduced agricultural crop yields and decreased forest growth.

Particulate matter (PM)
In terms of potential to harm human health, PM is one of the most important pollutants as it penetrates into sensitive regions of the respiratory system. PM is emitted from many sources and is a complex heterogeneous mixture whose size and chemical composition change in time and space, depending on emission sources and atmospheric and weather conditions. Particulate matter includes both primary and secondary PM; primary PM is the fraction of PM that is emitted directly into the atmosphere, whereas secondary PM forms in the atmosphere following the oxidation and transformation of precursor gases (mainly SO_2, NO_x, NH_3 and some volatile organic compounds (VOCs)). Smaller sizes of particulate matter such as $PM_{2.5}$, with a diameter up to 2.5 µm, are considered particularly harmful due to their greater ability to penetrate deep into the lungs.

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 Convention on Long-range Transboundary Air Pollution (LRTAP Convention). It also requests (Annex III to the NECD) that, in preparing these inventories and projections, Member States should use the latest version of the *EMEP/Corinair emission inventory guidebook* (i.e. the since-renamed *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 should apply the principles outlined in the UNECE guidelines for reporting emission data under the LRTAP Convention (UNECE, 2009). The historic and projected emission data presented must be 'transparent, consistent, comparable, complete and accurate'.

The EMEP/EEA guidebook provides comprehensive guidance for the estimation of emissions from all relevant source sectors. It also allows the Member States to use national or international methodologies to estimate emissions and projections other than those recommended in the guidebook, 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 be provided. To comply with the requirement for consistency in inventories, any time-series data provided pursuant to the NECD should be calculated in a consistent manner. Where methods are revised, these amended methods should 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_X, NMVOCs, 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:

a) emissions from international maritime traffic;
b) aircraft emissions beyond the landing and take-off cycle;
c) for Spain, emissions in the Canary Islands;
d) for France, emissions in the overseas departments;
e) for Portugal, emissions in Madeira and the 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 ([13]).

1.1.3 Emission ceilings

By 2010 at the latest, Member States shall limit their annual emissions of NO_X, NMVOC, SO_2, and NH_3 to the ceilings defined in the directive. In this report, emissions by Member States for the year 2009 and their projections for 2010 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 Tables 1.1 and 1.2.

The emission ceilings given in Annex II to the NECD (Table 1.2) 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 1990 situation. The Annex II emission ceilings for the European Union are stricter than the aggregated Member State emission ceilings given in Annex I to the NECD. There is no ceiling for NH_3 in Annex II to the NECD.

([13]) Data submitted by Member States under the NECD are available through the EEA data service: http://dataservice.eea.europa.eu/dataservice/ (accessed 15 April 2011).

Table 1.1 National 2010 emission ceilings for NO_x, NMVOC, SO_2, and NH_3, as defined in Annex I to the NECD

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 1.2 European Union 2010 emission ceilings for NO_x, NMVOC and SO_2, as defined in Annex II to the NECD

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

1.2 Preparation of NECD inventories in the European Union

1.2.1 Institutional arrangements and dataflow

Preparation of the aggregated European Union NECD inventory involves several stages: the Member States provide data; the European Commission and the EEA receive the data; and the EEA (via its ETC/ACM) compiles the data and prepares the inventory data and this report. The EEA and the European Commission also communicate with the Member States and disseminate the results.

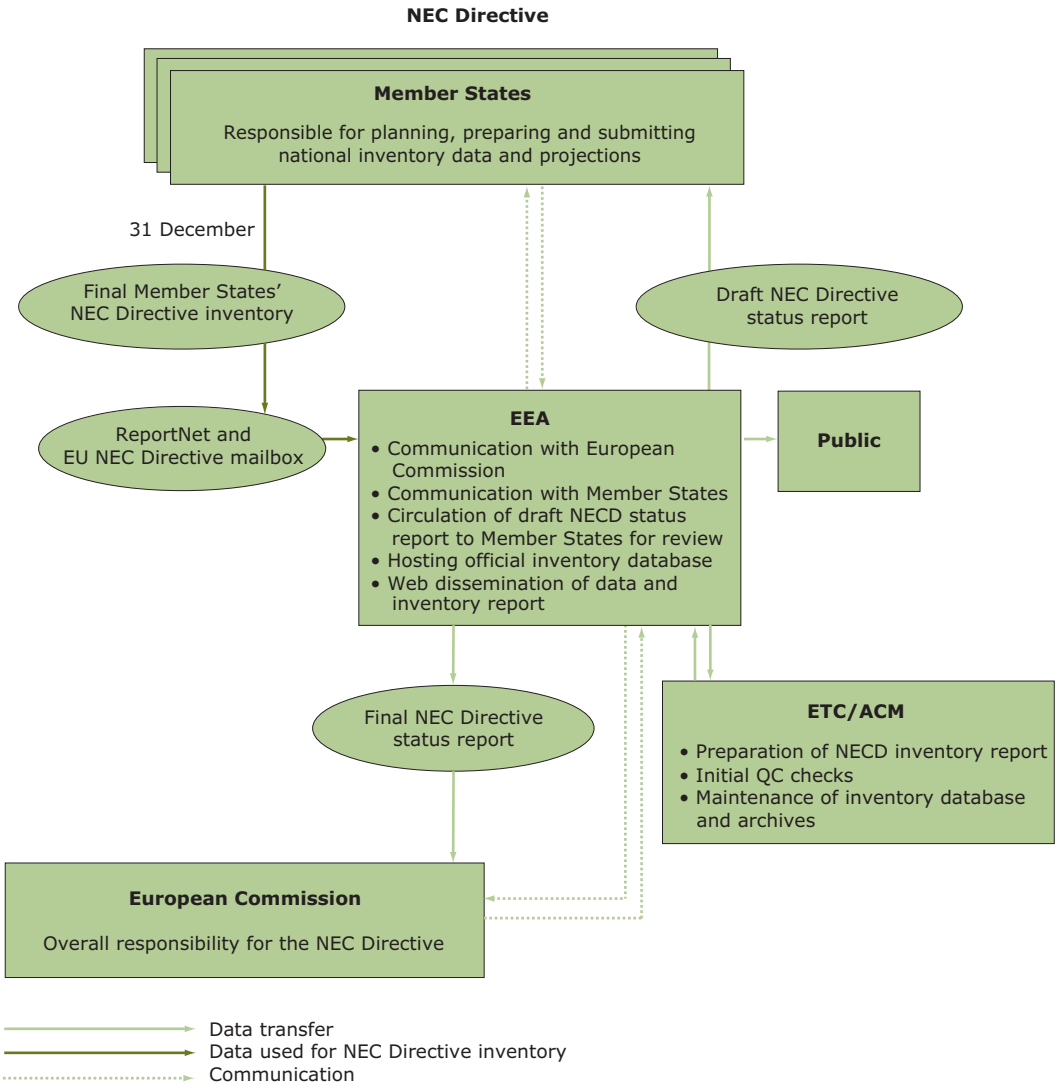
For reporting purposes, EU Member States are requested to make use of the EEA Eionet ReportNet tools. Within the Eionet priority dataflow agreement, the EEA requests its members to supply a copy of their report on NECD emissions, projections and programmes, as reported to the European Commission. The European Commission encourages EU accession and candidate countries to provide data on a voluntary basis.

A flowchart diagram illustrating the dataflow necessary to compile the European Union's NECD emission inventory is presented in Figure 1.1.

1.2.2 *Inventory QA/QC activities*

To ensure the data quality and to verify and validate their emission data, the Member States are encouraged to use appropriate quality assurance/quality control (QA/QC) procedures.

Figure 1.1 Dataflow for the compilation of the EU NECD emission inventory



These procedures should be consistent with those described in the EMEP/EEA guidebook.

There is no formal QA/QC plan in place for the European Union's NECD inventory. The main activities enhancing the quality of the inventory are the checks performed by the EEA's ETC/ACM on the status of each submission. More detailed quality assurance activities are performed by ETC/ACM and the 'Cooperative programme for monitoring and evaluation of the long-range transmission of air pollutants in Europe' (EMEP) 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 by the EMEP Centre for Emission Inventories and Projections (CEIP) and the EEA (e.g. CEIP/EEA, 2011).

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

1.2.3 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, and the EU Monitoring Mechanism ([14]) and its implementing provisions ([15]). Table 1.3 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 the pollutants included and slightly in terms of which sectors are included in the official national totals. The major differences are summarised in Table 1.4.

Table 1.3 Overview of air pollutant emission reporting obligations in the European Union

Legal obligation	Emission reporting requirements	Annual reporting deadline for EU Member States	Annual reporting deadline for the European Union
NEC Directive	Emissions of NO_X, NMVOCs, SO_2 and NH_3	31 December	–
LRTAP Convention	Emissions ([a]) of NO_X (as NO_2), NMVOCs, SO_X (as SO_2), NH_3, CO, HMs, POPs and PM	15 February	30 April
EU Monitoring Mechanism/UNFCCC	Emissions ([b]) of CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NO_X, CO, NMVOCs 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.

([b]) The greenhouse gases listed include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).

([14]) 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).

([15]) 2005/166/EC: Commission decision of 10 February 2005 laying down rules implementing Decision No 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol (notified under document number C(2005) 247) (OJ L 55, 1.3.2005, p. 57).

Table 1.4 Major differences between the reporting obligations of the LRTAP Convention, NECD and Council Decision No 280/2004/EC

	EU NECD	LRTAP Convention — NFR (a)	EU Monitoring Mechanism/ UNFCCC — CRF (b)
Air pollutants	NO_x, SO_2, NMVOCs, NH_3	NO_x, NMVOCs, SO_x, NH_3, CO, HMs, POPs, PM	CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, NO_x, CO, NMVOCs and SO_2
Domestic aviation (landing and take-off)	Included in national total	Included in national total	Included in national total
Domestic aviation (cruise)	*Not included in national total (c)*	*Not included in nationaltotal (c)*	Included in national total
International aviation (landing and take-off)	Included in national total	Included in national total	*Not included in national total (c)*
International aviation (cruise)	*Not included in national total (c)*	*Not included in national total (c)*	*Not included in national total (c)*
National navigation (domestic shipping)	Included in national total	Included in national total	Included in national total
International inland shipping	Included in national total	Included in national total	*Not included in national total (c)*
International maritime	*Not included in national total (c)*	*Not included in national total (c)*	*Not included in national total (c)*
Road transport	Emissions calculated basedon fuel sold (d)	Emissions calculated based on fuel sold (d)	Emissions calculated based on fuel sold
Emissions from natural sources	*Not included in national total (c)*	*Not included in national total (c)*	*Not included in national total (c)*

Note: (a) 'NFR' denotes 'nomenclature for reporting', a sectoral classification system developed by UNECE/EMEP for reporting air emissions.

(b) 'CRF' is the sectoral classification system developed by UNFCCC for reporting greenhouse gases.

(c) Categories not included in national totals should still be reported by parties as additional so-called 'memo items'.

(d) In addition, parties may report emission estimates on a fuel-consumed basis as a 'memo' item.

2 Status 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. Trend tables do not include information on emissions submitted by Member States under the NECD in previous reporting cycles (see Table A1.1 in Appendix 1). If projection data for 2010 were missing, data submitted in the previous reporting round were used.

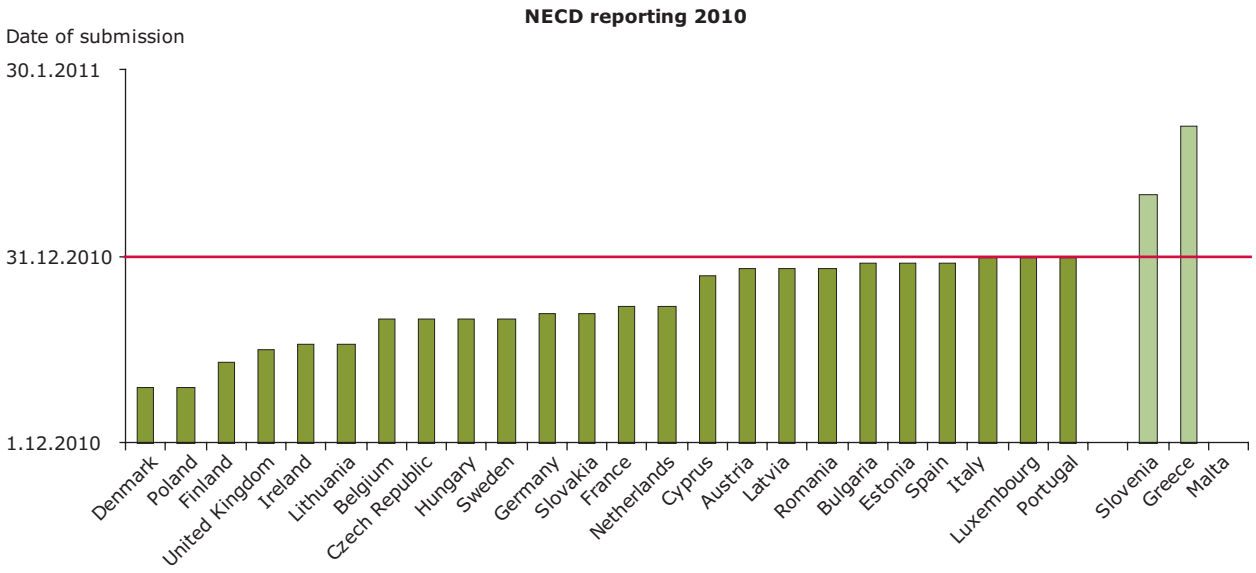
2.1 Timeliness

Pursuant to Article 8 of the NECD, by 31 December each year 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 2010 should also be submitted by the same date. In the 2010 reporting round (i.e. data due 31 December 2010), 24 of the 27 Member States submitted their national inventories of NO_X, NMVOC, SO_2, and NH_3 to the Commission on or before the reporting deadline of 31 December 2010. Two of the remaining Member States (Slovenia and Greece) delivered their inventories by 21 January 2011 (see Figure 2.1 and Table A2.1 in Appendix 2). Thirteen Member States provided additional or revised data between 24 December 2010 and 4 April 2011. With the exception of Malta, the timeliness of reporting is comparable to the previous year when 23 Member States reported by the required deadline and the remaining four provided data by 15 January 2010.

2.2 Completeness

In the 2010 reporting cycle ([16]), 24 Member States provided the mandatory information on final emissions for the year 2008, and 26 Member States provided preliminary emission data for 2009.

Figure 2.1 Status of reporting — date of first NECD inventory submission to the EEA or the European Commission



([16]) The reporting deadline for the 2010 reporting cycle was 31 December 2010.

Twenty-three Member States submitted projections for 2010. Hungary Romania and Spain did not submit projection data, and Malta did not submit any data. Several Member States — the Czech Republic, Latvia, Lithuania, Luxembourg, Poland, Portugal and Slovenia — did not revise their 2010 'with measures' emission projections (for a definition of projections terminology, see Box 3.1) compared with last years' submissions. The projections documented in this report for these Member States are therefore the same as those in the previous year's NEC status report (EEA, 2010a). Estonia only marginally changed its projections as compared to the 2009 reporting round.

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 datasets.

Many Member States report emissions from certain individual source categories as 'not estimated' (NE). According to the definition provided in Annex I to the guidelines for reporting emission data under the Convention on Long-range Transboundary Air Pollution (UNECE, 2009), the notation key 'NE' may be used by countries in situations when emissions occur, but have not been estimated or reported. This may be the case, for example, where emissions from such a source are known to be insignificant compared with the national total and/or resources do not allow an estimate to be made by the national inventory compilers. Chapter 4 presents an indicative analysis of the reporting of 'NE' by Member States, and the potential size of the underestimation introduced into national inventories as a result.

2.3 Basis for estimating emissions from mobile sources

It is considered good practice that, 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). In these guidelines it is specified 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, 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.

The NFR09 reporting template has a separate line for the 'National total' based on fuel used. Twelve Member States reported emission data in this line (see Table 2.1). However, for eight Member States the data given in this line are identical with the 'National total'. Still, it does not seem that all Member States that report identical numbers for 'National total' and 'National total' based on fuel used actually base their 'National total' on the fuel that was used. Germany and Lithuania for example indicate in the ''Additional information'' sheet of the NFR09 template that emissions from road transport are based on fuel sold.

2.4 Consistency and comparability

The NECD does not require that emission data be provided using a standard format. However, both the European Commission and the EEA encourage Member States to use the standardised NFR templates as defined in the guidelines for reporting emission data under the Convention on Long-range Transboundary Air Pollution (UNECE, 2009) when estimating and reporting emissions. All Member States which reported their emissions used the NFR format. Twenty-two Member States submitted their inventories only in NFR09 format, three Member States used only older NFR formats and one Member State used a combination of NFR09 and

Table 2.1 Basis for estimating emissions from mobile sources

Member State	Information given in NFR09 Table 1 for year 2009		Basis for estimates of Road Transport emissions according to Additional Info Table (NFR09)
	Data given in line 'National total' (fuel used)	Data in line 'National total' (fuel used) same as in line 'National total'	
Austria	Yes		
Belgium	Yes	Yes	
Bulgaria			
Cyprus	Yes	Yes	
Czech Republic			
Denmark			Fuel sold
Estonia	Yes	Yes	
Finland	Yes	Yes	
France	Yes	Yes	Fuel used
Germany	Yes	Yes	Fuel sold
Greece			
Hungary			
Ireland	Yes		
Italy			Fuel sold
Latvia			
Lithuania	Yes	Yes	Fuel sold
Luxembourg	Yes	Yes	Fuel used
Malta			
Netherlands	Yes		Fuel used
Poland			Fuel used
Portugal			
Romania			
Slovakia			
Slovenia			
Spain			Fuel sold
Sweden	Yes		
United Kingdom			Fuel used

Note: Austria informed (written communication with the EEA) that its national total emissions according to the NEC Directive are calculated on the basis of fuel used. Emissions given in 'National total (FU)' and the memo item 'Transport (fuel used)' are based on fuel sold.

Italy submitted data in NFR08 format. In this old reporting format no separate line for 'National total' (FU) exists. Hungary and Portugal, which used the NFR08 format as well, included a line for the 'National total' (FU)

The Netherlands said in a note that in the NFR template the value in the 'National total' line is the 'National total' based on fuel used and that in the line for 'National total' (FU) the 'National total' based on fuel sold is given.

Finland states in its IIR that calculation of emissions is based on fuel consumption of road vehicles and the emission factors. The definition of consumption of fuel on the country level is based on fuel sales.

Slovakia states in its IIR that emission calculation is based on total fuel consumption.

older formats (for different years). Use of older and/or non-consistent formats significantly complicates the processing and analysis of data.

More detailed information about the quality of the 2010 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, 2011).

2.5 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, nine Member States (Austria, Finland, Germany, Latvia, Poland, Portugal, Slovakia, Spain and Sweden) voluntarily submitted an inventory report together with their NECD inventories ([17]).

2.6 Reporting of socioeconomic data and incorporation of financial economic recession effects in 2010 projections

Only 13 Member States (Austria, Estonia, Finland, Greece, Ireland, Latvia, Lithuania, the Netherlands, Poland, Portugal, Slovakia, Slovenia, and the United Kingdom) reported the key socioeconomic parameters used in preparing their projections, despite this being a formal requirement of the NECD. For the vast majority of Member States, it is also not clear whether the anticipated effects of the financial economic recession have been taken into account in the reported 2010 projections.

([17]) For comparison, 17 Member States submitted Informative Inventory Reports (IIRs) under the LRTAP Convention by 5 April 2011.

3 Member State emission trends and projections

3.1 Introduction

This chapter presents the emission and projection trends of NO_X, NMVOC, SO_2 and NH_3, as reported by the Member States under the NECD. **The NECD does not require that Member States annually report a complete time series of emissions from 1990 onwards.** Rather, 'preliminary' emission data for the previous year, 'final' emission data for the previous year but one and projections for the year 2010 are formally the only data for which reporting is required. Complete time-series data were thus not available for all Member States. If Member States reported the required data, it is possible to aggregate the Member State emissions to an EU-27 total for the years 2008 and 2009. However, due to missing data from Malta for 2008 and 2009 and missing data from Luxembourg and Hungary for the year 2008, it was not possible to calculate the totals for the EU-27. Instead, an EU-27 total excluding Malta for the year 2009 is given.

Appendix 1 (Tables A1.1 and A1.2) provides an overview of the data available from the current NECD reporting rounds used in the tables within this report. No additional information has been used to fill any of the gaps in the NECD data received from the Member States for the years 1990 to 2009. The missing 2010 projection data were completed with data that were submitted under the NECD during the previous reporting round to enable an estimate of the EU-27 emissions for the year 2010.

With respect to Member State projections, there are three different basic types of projections commonly provided (AEA Technology, 2007). These comprise: 'without measures' (WOM) projections, which some reports call 'business as usual' (BAU) projections; 'with measures' (WM) projections; and 'with additional measures' (WAM) projections.

Box 3.1 sets out a definition for each of these projection types, in accordance with the Cleaner Air for Europe (CAFE) Working Group on Implementation (WGI) reporting guidelines (CAFE, 2006). Member States providing projections in older versions of the EMEP NFR file template 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 NECD itself makes reference to policies 'adopted and envisaged'. However, Annex III to the NECD also points to the methodologies of the LRTAP Convention under which the terms CLS and CRP were previously used.

In providing detailed information on adopted and envisaged policies and measures under the NECD, Member States have previously demonstrated a certain ambiguity in using these terms. For example, some Member States use 'business as usual' (BAU) to mean 'without measures', whereas other Member States used the term to mean 'with measures' (AEA Technology, 2007).

3.1.1 EU-27 projections overview

Figure 3.1 and Table 3.1 illustrate the progress of the EU-27 towards meeting its emission ceilings specified in Annexes I and II to the NECD. Analysis shows that emissions in the EU-27 are anticipated to be greater than the aggregated 2010 ceiling (Annex I to the NECD) for NO_X but lower than the ceilings for the remaining pollutants (SO_2, NMVOC and NH_3).

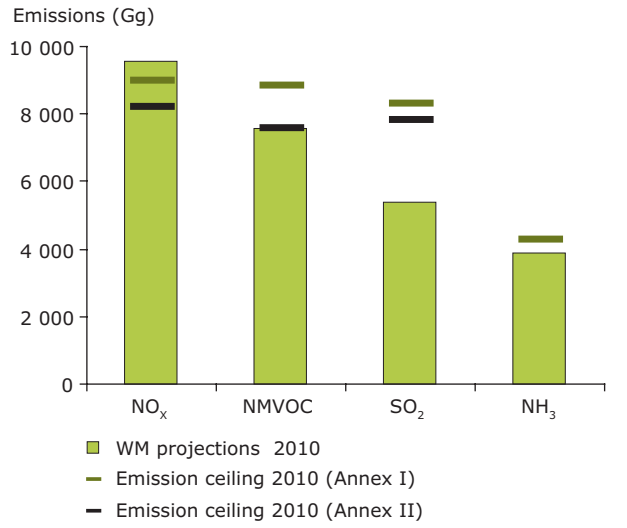
Box 3.1 Projection scenarios as defined in the CAFE WGI reporting guidelines

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.

A **with measures** projection takes into account all currently implemented and adopted policies and measures.

A **with additional measures** projection takes into account all currently implemented and adopted policies and measures plus all those planned.

Figure 3.1 Aggregated Member State projections compared with EU-27 emission ceilings defined in NECD Annexes I and II



Note: EU-27 WM projections comprise the aggregated WM projection data reported by the individual Member States. Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

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.

Similarly, of the three stricter Annex II emission ceilings which are designed with the aim of broadly meeting the interim environmental objectives as set out in Article 5 of the NECD, only the NO_x ceiling is projected to be missed. NMVOC emissions are projected to be only marginally below the Annex II ceiling.

Table 3.2 provides an overview of Member State emission projections submitted under the NECD in comparison with the 2010 ceilings. Further information on the progress by individual Member States towards achieving the emission ceilings is provided in subsequent sections of this chapter. Data on 2010 WM projections are available from all Member States except Spain, Hungary, Malta and Romania. For these countries, projection data submitted in 2009 were used.

Comparison of the WM 2010 projections reported by Member States in 2010 with the previous 2009 reports shows that seven Member States have not revised emission projections for any of the four NEC pollutants. In addition four Member States have not submitted any projection data. Several Member States have revised their projections downwards (seven Member States for NO_x, eight for NMVOC, nine for SO_2 and five for NH_3). This may reflect the lower emissions that are expected to occur as a result of lower activity due to the economic recession, but only Germany clearly stated that its

Table 3.1 Indicative comparison of EU-27 emission ceilings to be attained with EU-27 projections

	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_x	9 572	9 003	569	6 %	8 180	1 392	17 %
NMVOC	7 567	8 848	– 1 281	– 14 %	7 585	– 18	– 0.2 %
SO_2	5 412	8 297	– 2 885	– 35 %	7 832	– 2 420	– 31 %
NH_3	3 905	4 294	– 389	– 9 %			

Note: EU-27 WM projections comprise the aggregated WM projection data reported by the individual Member States. Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

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.

updated projections for 2010 take into account the 2009 economic crisis. However, Germany revised the projections for NO_X, NMVOC and SO_2 upwards.

Some Member States (seven Member States for NO_X, four for NMVOC, four for SO_2 and six for NH_3) now expect higher emissions to occur in 2010 than were projected before (see Figures 3.3, 3.5, 3.7 and 3.9). Again, the influence of the consideration of the economic recession or the recovery after the economic recession was not documented clearly in most cases. Finland has revised the projection for NH_3 upwards in line with the change of inventory data starting from 1990.

Table 3.2 Overview of Member State emission projections submitted under the NECD (as of 5 April 2011) and emission ceilings for 2010

Member State	NO_x projections (Gg)			NO_x	Comparison WM to ceiling	NMVOC projections (Gg)			NMVOC	Comparison WM to ceiling	SO_2 projections (Gg)			SO_2	Comparison WM to ceiling	NH_3 projections (Gg)			NH_3	Comparison WM to ceiling
	WM	WAM	Ceilings			WM	WAM	Ceilings			WM	WAM	Ceilings			WM	WAM	Ceilings		
Austria **	144	NE	103	×		154	NE	159	√		21	NE	39	√		62	NE	66	√	
Belgium	228	NE	176	×		112	NE	139	√		69	NE	99	√		66	NE	74	√	
Bulgaria	247	NE	247	√		175	NE	175	√		480	NE	836	√		108	NE	108	√	
Cyprus	19	NE	23	√		11	NE	14	√		18	NE	39	√		5	NE	9	√	
Czech Republic	272	NE	286	√		170	NE	220	√		207	NE	265	√		60	NE	80	√	
Denmark	126	NE	127	√		90	NE	85	×		20	NE	55	√		69	NE	69	√	
Estonia	39	NE	60	√		41	NE	49	√		80	NE	100	√		9	NE	29	√	
Finland	170	NE	170	√		130	NE	130	√		110	NE	110	√		31	NE	31	√	
France	1 085	NE	810	×		781	NE	1 050	√		301	NE	375	√		729	NE	780	√	
Germany	1 379	NE	1 051	×		1 330	NE	995	×		475	NE	520	√		581	NE	550	×	
Greece	379	NE	344	×		244	NE	261	√		408	NE	523	√		60	NE	73	√	
Hungary *	164	NE	198	√		123	NE	137	√		72	NE	500	√		78	NE	90	√	
Ireland	85	85	65	×		49	49	55	√		25	24	42	√		106	106	116	√	
Italy	950	NE	990	√		925	NE	1 159	√		270	NE	475	√		409	NE	419	√	
Latvia	45	NE	61	√		55	NE	136	√		4	NE	101	√		14	NE	44	√	
Lithuania	44	NE	110	√		56	NE	92	√		36	NE	145	√		55	NE	84	√	
Luxembourg	13	13	11	×		9	9	9	√		3	3	4	√		5	5	7	√	
Malta */**	9	NE	8	×		4	NE	12	√		14	NE	9	×		2	NE	3	√	
Netherlands	264	NE	260	×		144	NE	185	√		42	NE	50	√		131	NE	128	×	
Poland	827	NE	879	√		603	NE	800	√		994	NE	1 397	√		284	NE	468	√	
Portugal	242	NE	250	√		194	NE	180	×		133	NE	160	√		69	NE	90	√	
Romania *	350	NE	437	√		343	NE	523	√		785	NE	918	√		206	NE	210	√	
Slovakia	88	88	130	√		67	66	140	√		63	63	110	√		26	24	39	√	
Slovenia	46	NE	45	×		38	NE	40	√		16	NE	27	√		20	NE	20	√	
Spain */**	1 083	NE	847	×		778	NE	662	×		364	NE	746	√		381	NE	353	×	
Sweden	141	NE	148	√		166	NE	241	√		30	NE	67	√		47	NE	57	√	
United Kingdom	1 132	NE	1 167	√		774	NE	1 200	√		372	NE	585	√		291	NE	297	√	
EU-27	**9 572**	**NE**	**9 003**	**×**		**7 567**	**NE**	**8 848**	**√**		**5 412**	**NE**	**8 297**	**√**		**3 905**	**NE**	**4 294**	**√**	

Note: '✓' 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 Member State anticipates that it will not meet its ceiling.

'NE' indicates that for the respective scenario no data are available

'*' indicates that data were submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

'**' Following finalisation of this report, new projections from Austria, Malta and Spain were received. The comparisons provided in the table above and in later sections do not take these updated values into account. The new information indicates that ceilings for Malta (NO_x and SO_2) and Spain (NH_3) will now be met in contrast to the original assessment.

Germany also provided a 145 Gg lower estimate for NO_x emissions that does not include source categories 4 'Agriculture' as these sources were not taken into account when setting the original NEC ceilings. Further, Germany also provided a 278 Gg lower estimate for NMVOC emissions that does not include source categories 4 'Agriculture' and 2D2 'Food and drink' as these sources were not taken into account when setting the original NEC ceilings.

The trend tables (Tables 3.4, 3.5, 3.6 and 3.7) below show, for each pollutant, a comparison ([18]) between 2009 emissions and those reported for the years 1990 and 2008 (if data were available). This illustrates the development of the emission trends within individual Member States. Figures 3.2, 3.4, 3.6 and 3.8 illustrate the relative difference ([19]) between emissions in 2009 and the emission ceilings, and between Member State projected emissions for 2010 and the ceilings. Where percentage values are positive, it indicates that 2009 emissions were above the emission ceilings or that WM projections imply that the 2010 ceiling will not be achieved. Almost all Member States that reported data for 2008 and 2009 reported emission reductions for all pollutants. The years 2008 and 2009 were both affected by the economic recession. For the Member States that reported data, it seems that emission reductions between 2007 and 2008 as well as between 2008 and 2009 were higher than the previous years for NO_X, NMVOC and SO_2. However, as changes between years differed substantially between Member States and data time series were not complete for all Member States, it cannot be said with certainty that the impact of the economic recession is seen at EU-27 level for total NO_X, NMVOC and SO_2 emissions.

The trends of emission data reported by Member States under the NECD and the LRTAP Convention are not consistent for all countries. An explicit analysis of these differences is not within the scope of this report, but is provided in the joint EMEP/EEA Stage 2 emission inventory review (EMEP/EEA, 2011).

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

For comparison, an overview of the progress in the non-EU EEA member countries in meeting their respective 2010 emission ceilings set under the UNECE LRTAP Convention's Gothenburg Protocol is shown in Table 3.3. Iceland and Turkey have not signed or ratified the Gothenburg Protocol and have no ceiling. Lichtenstein, Norway and Switzerland project to miss at least one of their four emission ceilings, although only for Norway NO_X is a sizeable exceedance (17 %) of the ceiling projected to occur in 2010. For the other countries and pollutants the projected exceedances are small.

Table 3.3 Overview of non-EU EEA member countries' emission projections submitted under the Gothenburg Protocol to the UNECE LRTAP Convention and emission ceilings for 2010

Country	NO_x (Gg)		Comparison to ceiling	NMVOC (Gg)		Comparison to ceiling	SO_2 (Gg)		Comparison to ceiling	NH_3 (Gg)		Comparison to ceiling
	WM	Ceilings		WM	Ceilings		WM	Ceilings		WM	Ceilings	
Liechtenstein	0.22	0.37	√	0.53	0.86	√	0.04	0.11	√	0.17	0.15	x
Norway	183	156	x	157	195	√	23	22	x	23	23	√
Switzerland	70	79	√	88	144	√	17	26	√	66	63	x
Iceland	30	NA	NA	7	NA	NA	29	NA	NA	NE	NA	NA

Note: Projections for Iceland, Liechtenstein, Norway and Switzerland are the latest reported projections 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 have yet signed the Gothenburg Protocol.

([18]) Changes of emissions in each country during 2008–2009 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 in 1990–2009 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.

([19]) The relative difference between emissions in 2009 and the emission ceilings was estimated as 100 x $(E_{2009} - E_{ceiling})/E_{ceiling}$ (%), where E_{2009} and $E_{ceiling}$ are the 2009 emissions and the 2010 emission ceiling value. The relative difference between Member State projected emissions for 2010 and the respective ceilings was estimated as 100 x $(P_{2010} - E_{ceiling})/E_{ceiling}$ (%), where P_{2010} is the reported WM projection for 2010 and $E_{ceiling}$ is the 2010 emission ceiling value.

3.2 NO_x emissions and projections

For the EU-27, it was only possible to calculate a NO_x emission total excluding Malta for 2009. For other years, data of several Member States were missing ([20]) (Table 3.4) although the submission of data for 2008 is a formal requirement under the NEC Directive.

Compared with 1990, emissions decreased in 14 Member States (from 15 Member States which reported 1990 and 2009 data). The largest emitters in 2009 were Germany, France and the United Kingdom.

Between 2008 and 2009 all Member States that reported data reported emission reductions. As emission estimates for 2008 and 2009 are missing for several Member States, the total change for the EU-27 could not be calculated. The highest absolute reductions between 2008 and 2009 were achieved in the United Kingdom and Spain.

For 14 Member States, NO_x emissions in the year 2009 were already lower than their respective ceilings (Figure 3.2). Denmark and Sweden had NO_x emissions in 2009 higher than their emission ceilings but are confident that they will reach their ceilings in 2010. Of the EU-27 Member States ([21]), only 16 (same number as in the 2009 submission) expect to be at, or below, their respective emission ceilings by 2010 (Figure 3.2). Bulgaria and Finland report WM projections identical to the 2010 NO_x emission ceilings set in the NECD. As for both countries the 2009 emissions reported were already significantly below its 2010 ceilings, it seems likely that Bulgaria and Finland will indeed meet the 2010 NO_x ceilings. Bulgaria, Estonia, Latvia, Lithuania, Luxembourg and Romania expect that NO_x emission changes of more than 20 % have occurred between 2009 and 2010. Six Member States submitted WM projections more than 20 % above the ceilings (Figure 3.2). WM projections submitted in the 2010 reporting round show that the largest exceedances above the NECD ceilings in absolute terms are expected in Germany (328 Gg) and France (275 Gg). Germany also provided a 145 Gg lower estimate for NO_x emissions that does not include source categories 4 'Agriculture' as these sources were not taken into account when setting the original NEC ceilings. This lower estimate also lies above the German emission ceiling.

A comparison of NO_x projections (WM) submitted in 2005, 2006, 2007, 2008, 2009 and 2010 (Figure 3.3) shows that Austria, Belgium, Estonia, Finland, France, Lithuania, Slovakia and Spain changed their projections considerably during those years ([22]).

Compared with the projections submitted in 2009, seven Member States revised their NO_x projections downwards in their 2010 submission. The highest relative changes ([23]) were reported by Germany (+ 24 %) and Slovakia (– 19 %). Thirteen Member States have not changed their NO_x projections since the 2009 submission, including Latvia and Portugal, which mentioned explicitly in their IIR that their projection data were not updated and including Hungary, Malta, Romania and Spain, which have not sent projection data in the 2010 submission round.

([20]) As noted previously, the NECD does not require the reporting of emissions from 1990; however, Member States are encouraged to do so to enable an improved analysis of the emission trends.
([21]) Spain, Hungary, Malta and Romania did not report projections data for the 2010 reporting cycle. Data of these Member States are therefore old projections submitted in 2009.
([22]) The changes were greater than 30 percentage points.
([23]) Changes of projections reported in 2009 and 2010 are expressed as 100 x $(WM_{2010} - WM_{2009})/WM_{2009}$ (%), where WM_{2010} and WM_{2009} are 'with measures' projections for 2010 submitted in 2009 and 2010.

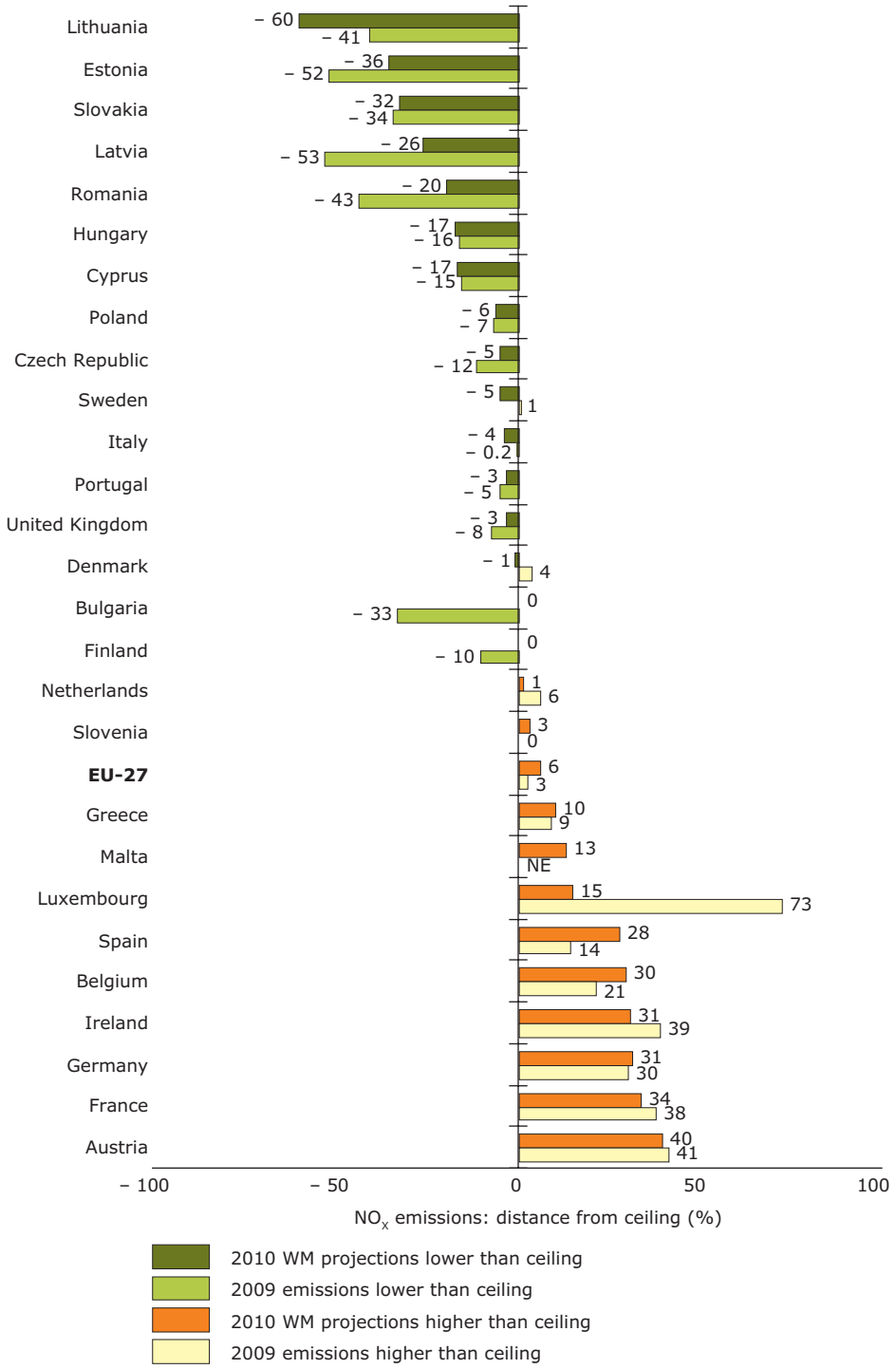
Table 3.4 NO_x emission trends for Member States, 1990–2009

NO_x (Gg)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Change 2008–2009 (%)	Change 1990–2009 (%)	Contribution to EU-27 in 2009 (%)
Austria	181	163	164	165	163	165	164	168	168	164	159	145	– 9	– 20	2
Belgium	400	390	334	NE	NE	NE	NE	290	268	263	241	213	– 12	– 47	2
Bulgaria	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	192	164	– 14	NE	2
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	20	19	– 2	NE	0
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	265	253	– 5	NE	3
Denmark	278	268	201	201	198	206	190	182	183	169	151	132	– 13	– 52	1
Estonia	72	38	37	39	40	41	38	36	34	38	34	29	– 16	– 60	0
Finland	300	259	210	220	208	219	205	177	193	184	166	153	– 8	– 49	2
France	1 834	1 704	1 575	1 544	1 522	1 484	1 452	1 424	1 356	1 295	1 202	1 117	– 7	– 39	12
Germany	2 940	2 209	1 911	NE	NE	NE	NE	1 583	NE	NE	1 468	1 370	– 7	– 53	15
Greece	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	395	375	– 5	NE	4
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	166	NE	NE	2
Ireland	126	127	138	140	130	126	126	127	122	121	112	90	– 20	– 28	1
Italy	2 035	1 911	1 448	1 419	1 365	1 342	1 306	1 221	1 167	1 132	1 061	988	– 7	– 51	11
Latvia	65	39	36	39	39	39	39	37	37	38	34	29	– 16	– 56	0
Lithuania	136	49	NE	NE	NE	NE	NE	NE	NE	69	68	65	– 4	– 52	1
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	19	NE	NE	0
Malta	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Netherlands	563	468	395	389	375	368	354	341	327	310	300	276	– 8	– 51	3
Poland	NE	NE	838	806	796	808	804	811	921	860	832	820	– 1	NE	9
Portugal	234	268	291	294	304	284	287	290	269	257	245	238	– 3	1	3
Romania	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	282	247	– 12	NE	3
Slovakia	NE	NE	107	108	100	96	100	104	98	96	94	86	– 9	NE	1
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	53	45	– 15	NE	0
Spain	1 217	1 271	1 284	1 257	1 296	1 278	1 320	1 308	1 264	1 264	1 080	966	– 11	– 21	10
Sweden	301	266	210	201	195	189	180	174	168	163	153	149	– 3	– 50	2
United Kingdom	NE	NE	NE	NE	NE	NE	NE	1 536	1 486	1 403	1 244	1 078	– 13	NE	12
EU-27	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**9 234**	**NE**	**NE**	**100**

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

The EU-27 total for 2009 excludes data from Malta as Malta did not provide an emission estimate for this year.

Figure 3.2 Distance from ceiling for NO_x emissions in 2009 and for projected NO_x emissions in 2010 (with measures)



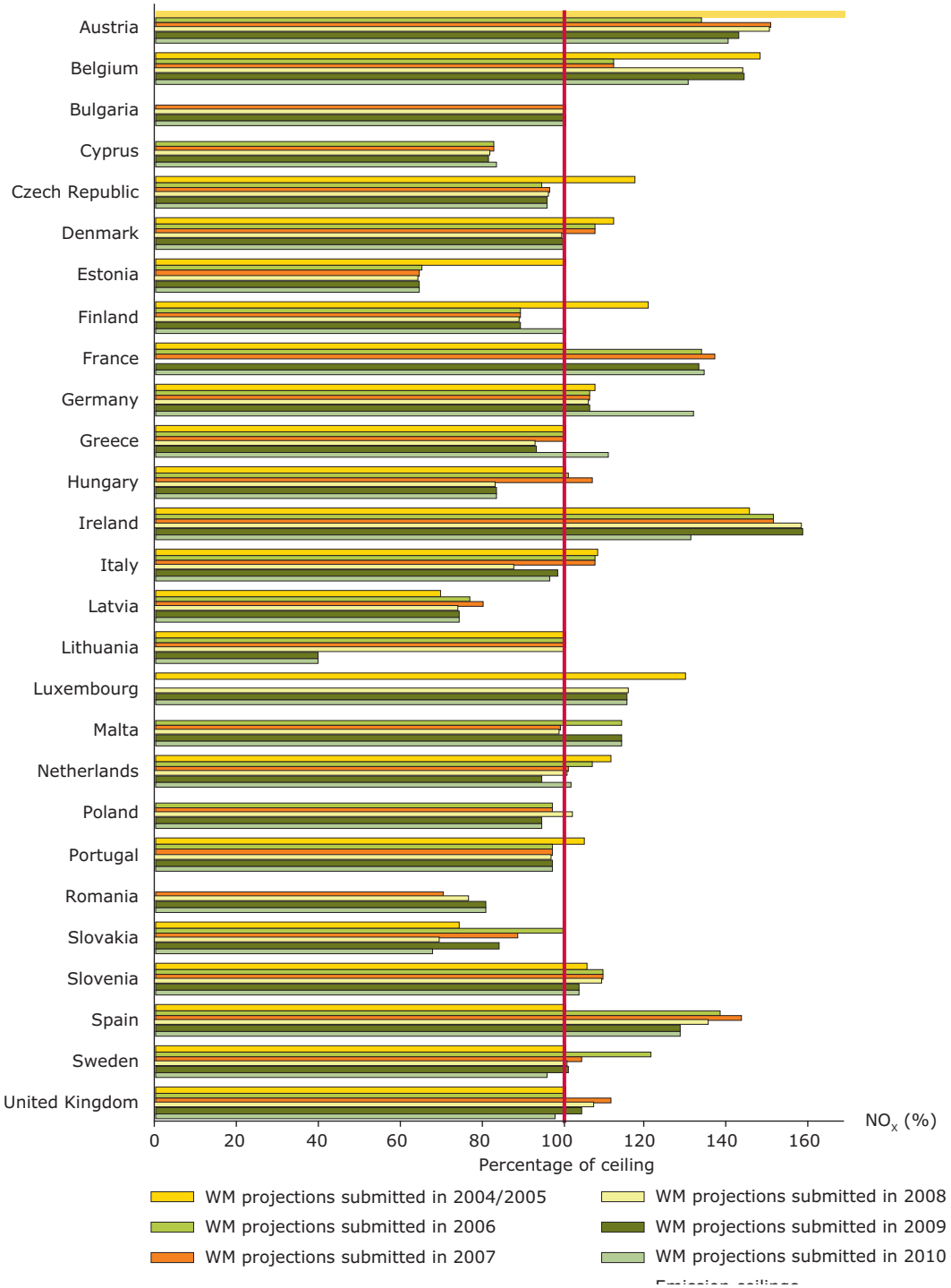
Note: Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

Malta did not report emission data for 2009. Latvia and Portugal mentioned in their IIR that their projection data were not updated.

Bulgaria and Finland reported projection data identical to their emission ceilings.

Germany also provided a 145 Gg lower estimate for NO_x emissions that does not include source categories 4 'Agriculture' as these sources were not taken into account when setting the original NEC ceilings.

Figure 3.3 Comparison of NO_x projections (WM) submitted in 2005, 2006, 2007, 2008, 2009 and 2010, and ceilings in 2010



Note: Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

Latvia and Portugal mentioned in their IIR that their projection data were not updated.

Bulgaria and Finland reported projection data identical to their emission ceilings.

Germany also provided a 145 Gg lower estimate for NO_x emissions that does not include source categories 4 'Agriculture' as these sources were not taken into account when setting the original NEC ceilings.

3.3 NMVOC emissions and projections

For the EU-27, it was only possible to calculate a total NMVOC emission total excluding Malta for 2009. For other years, data of several Member States were missing ([24]) (Table 3.5) although the submission of data for 2008 is a formal requirement under the NEC Directive.

Compared with 1990, emissions decreased in all Member States which reported 1990 and 2009 data (15 Member States). The largest emitters in 2009 were Germany, Italy, France and the United Kingdom.

Between 2008 and 2009, 23 Member States reported emission reductions (from 24 Member States which reported 2008 and 2009 data). As emission estimates for 2008 and 2009 are missing for several Member States, the total change for the EU-27 could not be calculated. The highest absolute reductions between 2008 and 2009 were achieved in the United Kingdom and France.

For 22 Member States, NMVOC emissions in the year 2009 were already lower than their respective ceilings (Figure 3.4). Of the EU-27 Member States, 23 (24 in the 2009 submission) expect to be at, or below, their respective emission ceilings by 2010 (Figure 3.4). Bulgaria and Finland reported WM projections identical to their 2010 NMVOC emission ceilings set in the NECD. As the emissions reported in 2009 for these two Member States are already significantly below their 2010 ceilings, it seems likely that they will indeed meet the 2010 NMVOC ceilings. Austria, Bulgaria and Romania expect that NMVOC emission changes of more than 20 % have occurred between 2009 and 2010. Only Germany submitted WM projections more than 20 % above the ceilings (Figure 3.4). Largest exceedances above the NECD ceilings in absolute terms are expected for Germany (335 Gg) and Spain (116 Gg). Germany also provided a 278 Gg lower estimate for NMVOC emissions that does not include source categories 4 'Agriculture' and 2D2 'Food and drink' as these sources were not taken into account when setting the original NEC ceilings. This lower estimate also lies above the German emission ceiling.

A comparison of NMVOC projections (WM) submitted in 2005, 2006, 2007, 2008, 2009 and 2010 (Figure 3.5) shows that Germany, Ireland, Lithuania, Poland, Portugal, Spain, Sweden and the United Kingdom changed their projections considerably during those years ([25]).

Compared with the projections submitted in 2009, eight Member States revised their NMVOC projections downwards in their 2010 submission. The highest relative changes ([26]) were reported by Germany (+ 35 %), France (– 26 %) and Belgium (– 16 %). Fifteen Member States have not changed their NMVOC projections since the 2009 submission, including the four Member States (Hungary, Malta, Romania and Spain) that have not sent projection data in the 2010 reporting round and Latvia and Portugal that have mentioned explicitly in their IIR that their projection data were not updated.

([24]) As noted previously, the NECD does not require the reporting of emissions from 1990; however, Member States are encouraged to do so to enable an improved analysis of the emission trends.
([25]) The changes in reported projections were greater than 30 percentage points.
([26]) Changes of projections reported in 2009 and 2010 are expressed as 100 x (WM_{2010} — WM_{2009})/WM_{2009} (%), where WM_{2010} and WM_{2009} are 'with measures' projections for 2010 submitted in 2009 and 2010.

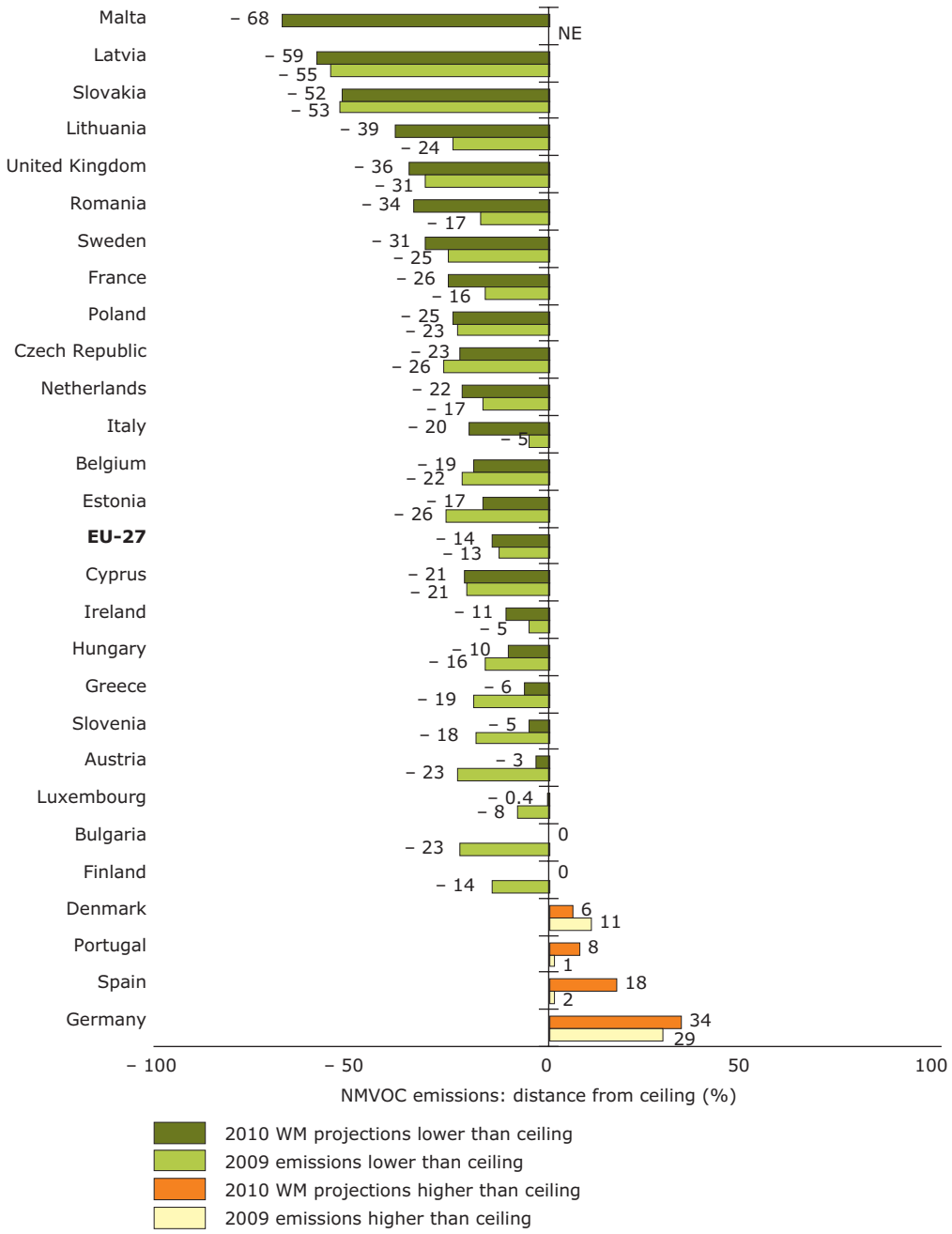
Table 3.5 NMVOC emission trends for Member States, 1990–2009

NMVOC (Gg)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Change 2008–2009 (%)	Change 1990–2009 (%)	Contri–bution to EU-27 in 2009 (%)
Austria	273	224	175	174	173	170	151	161	171	158	149	122	– 18	– 55	2
Belgium	316	270	206	NE	NE	NE	NE	153	146	126	118	108	– 8	– 66	1
Bulgaria	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	123	135	10	NE	2
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	12	11	– 7	NE	0
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	166	162	– 3	NE	2
Denmark	187	166	138	130	127	121	119	116	111	106	101	94	– 7	– 50	1
Estonia	70	50	46	46	45	44	44	41	40	41	38	36	– 5	– 48	0
Finland	226	185	160	155	154	145	140	131	133	129	118	111	– 6	– 51	1
France	2 551	2 143	1 707	1 620	1 487	1 400	1 319	1 226	1 122	1 039	963	878	– 9	– 66	11
Germany	3 751	2 157	1 663	NE	NE	NE	NE	1 415	NE	NE	1 298	1 285	– 1	– 66	17
Greece	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	228	212	– 7	NE	3
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	115	NE	NE	1
Ireland	88	81	73	71	67	64	61	60	58	57	55	52	– 5	– 41	1
Italy	2 004	2 076	1 595	1 511	1 443	1 375	1 322	1 248	1 217	1 182	1 126	1 100	– 2	– 45	14
Latvia	102	67	65	69	65	65	110	73	75	84	74	61	– 18	– 40	1
Lithuania	118	70	NE	NE	NE	NE	NE	NE	NE	74	71	70	– 2	– 41	1
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	8	NE	NE	0
Malta	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Netherlands	464	328	232	208	196	183	172	176	167	165	164	154	– 6	– 67	2
Poland	NE	NE	599	577	600	585	597	566	628	568	641	615	– 4	NE	8
Portugal	301	264	238	227	223	212	207	201	197	192	187	183	– 3	– 39	2
Romania	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	465	432	– 7	NE	6
Slovakia	NE	NE	69	73	72	73	73	76	71	69	69	65	– 5	NE	1
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	33	33	– 2	NE	0
Spain	1 007	946	973	952	876	883	867	829	815	805	754	673	– 11	– 33	9
Sweden	353	247	200	188	186	188	186	184	181	182	181	180	– 1	– 49	2
United Kingdom	NE	NE	NE	NE	NE	NE	NE	1 078	1 030	1 000	926	823	– 11	NE	11
EU-27	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**7 719**	**NE**	**NE**	**100**

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

The EU-27 total for 2009 excludes data from Malta as Malta did not provide an emission estimate for this year.

Figure 3.4 Distance from ceiling for NMVOC emissions in 2009 and for projected NMVOC emissions in 2010 (with measures)



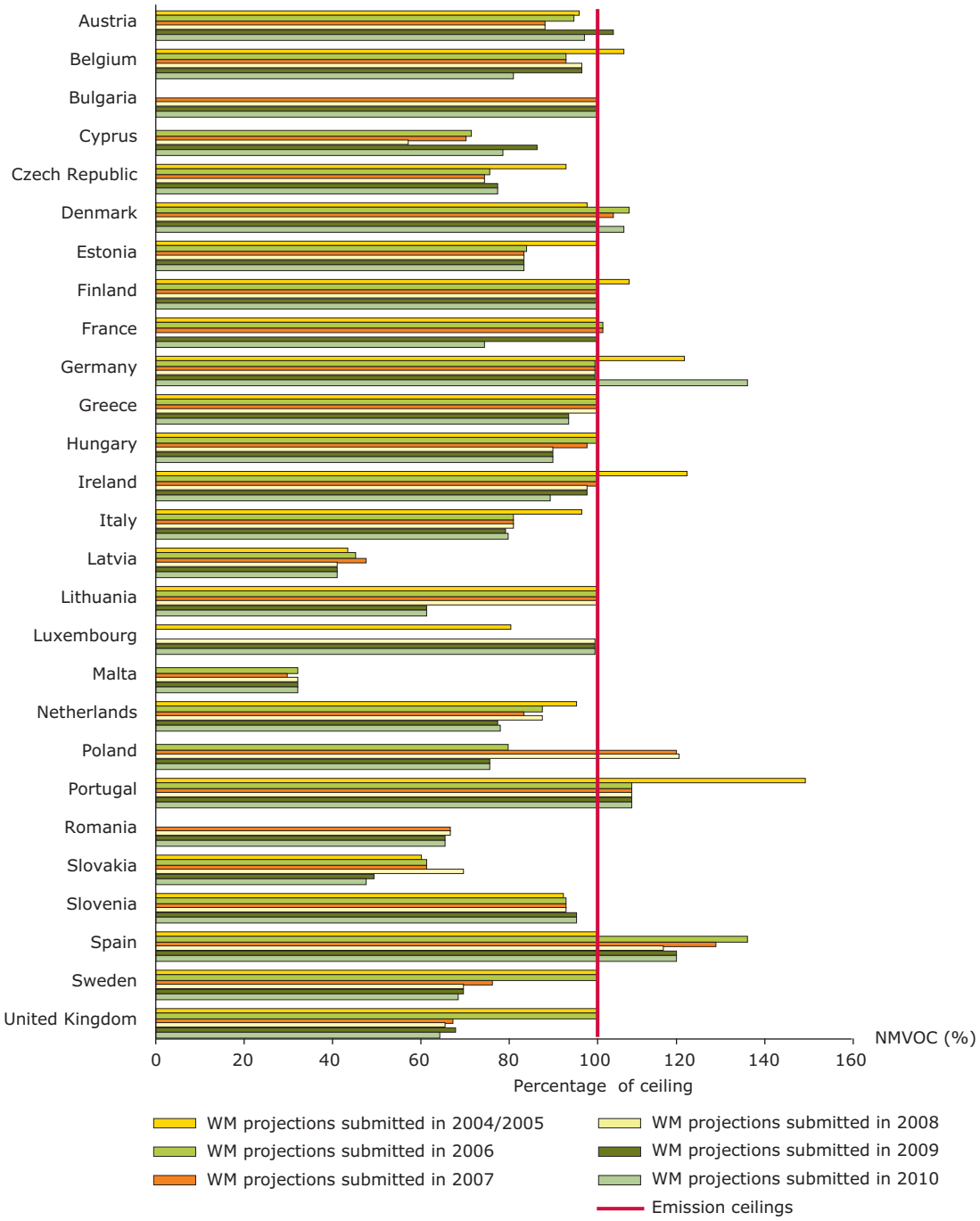
Note: Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

Latvia and Portugal mentioned in their IIR that their projection data were not updated.

Bulgaria and Finland reported projection data identical to their emission ceilings.

Germany also provided a 278 Gg lower estimate for NMVOC emissions that does not include source categories 4 'Agriculture' and 2D2 'Food and drink' as these sources were not taken into account when setting the original NEC ceilings.

Figure 3.5 Comparison of NMVOC projections (WM) submitted in 2005, 2006, 2007, 2008, 2009 and 2010, and ceilings in 2010



Note: Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

Latvia and Portugal mentioned in their IIR that their projection data were not updated.

Bulgaria and Finland reported projection data identical to their emission ceilings.

Germany also provided a 278 Gg lower estimate for NMVOC emissions that does not include source categories 4 'Agriculture' and 2D2 'Food and drink' as these sources were not taken into account when setting the original NEC ceilings.

3.4 SO_2 emissions and projections

For the EU-27, it was only possible to calculate a SO_2 emission total excluding Malta for 2009. For other years, data of several Member States were missing ([27]) (Table 3.6) although the submission of data for 2008 is a formal requirement under the NEC Directive.

Compared with 1990, emissions decreased in all Member States which reported 1990 and 2009 data (15 Member States). The largest emitters in 2009 were Poland and Bulgaria.

Between 2008 and 2009, all Member States that provided data reported emission reductions (24 Member States). As emission estimates for 2008 and 2009 are missing for several Member States, the total change for the EU-27 could not be calculated. The highest absolute reductions between 2008 and 2009 were achieved in Poland, Romania and the United Kingdom.

For all Member States that reported data, SO_2 emissions in the year 2009 were already lower than their respective ceilings (Figure 3.6). All Member States except Malta expect to be at, or below, their respective emission ceilings by 2010 (Figure 3.6).

Finland reported WM projections identical to their 2010 SO_2 emission ceilings set in the NECD. As the emissions reported in 2009 for Finland are already significantly below its 2010 ceilings, it seems likely that Finland will indeed meet the 2010 SO_2 ceilings. Bulgaria, Denmark, Estonia, Finland, Hungary, Ireland, Portugal, Romania and Slovenia expect that SO_2 emission changes of more than 20 % have occurred between 2009 and 2010.

A comparison of SO_2 projections (WM) submitted in 2005, 2006, 2007, 2008, 2009 and 2010 (Figure 3.7) shows that 14 Member States changed their projections considerably during those years ([28]).

Compared with the projections submitted in 2009, nine Member States revised their SO_2 projections downwards in their 2010 submission. The highest relative changes ([29]) were reported by Bulgaria (– 43 %) and Belgium (– 23 %). Fourteen Member States have not changed their SO_2 projections since the 2009 submission, including Latvia and Portugal, which mentioned explicitly in their IIR that their projection data were not updated and including the four Member States (Hungary, Malta, Romania and Spain), that have not sent projection data in the 2010 submission round.

([27]) As noted previously, the NECD does not require the reporting of emissions from 1990; however, Member States are encouraged to do so to enable an improved analysis of the emission trends.
([28]) The changes in reported projections were greater than 30 percentage points.
([29]) Changes of projections reported in 2009 and 2010 are expressed as 100 x (WM_{2010} — WM_{2009})/WM_{2009} (%), where WM_{2010} and WM_{2009} are 'with measures' projections for 2010 submitted in 2009 and 2010.

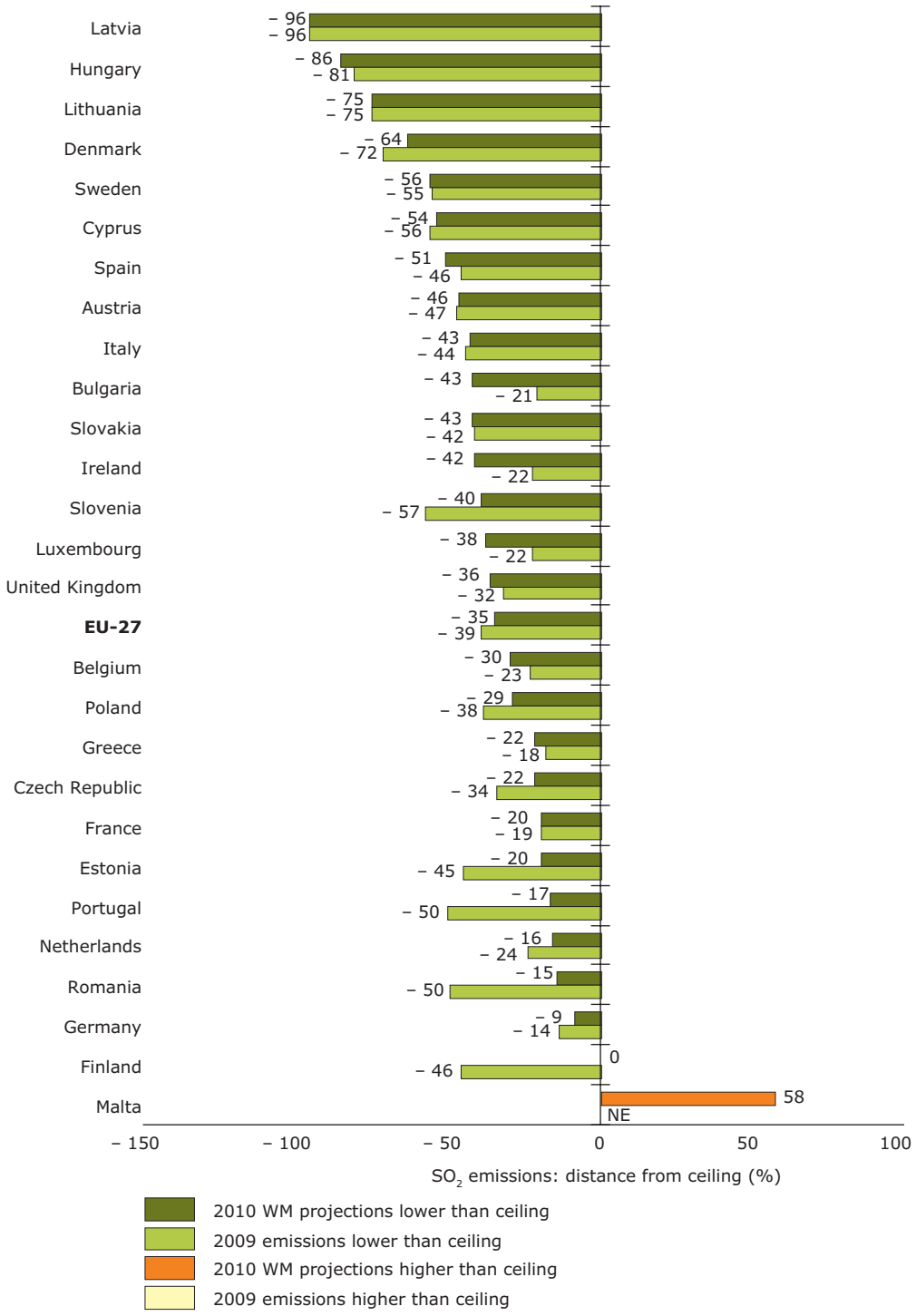
Table 3.6 SO_2 emission trends for Member States, 1990–2009

SO_2 (Gg)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Change 2008–2009 (%)	Change 1990–2009 (%)	Contribution to EU-27 in 2009 (%)
Austria	74	46	31	32	30	31	27	27	28	25	22	21	– 8	– 72	0
Belgium	362	261	172	NE	NE	NE	NE	145	135	125	97	76	– 21	– 79	2
Bulgaria	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	735	658	– 11	NE	13
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	22	17	– 21	NE	0
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	177	174	– 1	NE	3
Denmark	179	140	30	28	26	33	27	24	27	24	20	15	– 21	– 91	0
Estonia	274	116	97	91	87	100	88	76	70	88	69	55	– 21	– 80	1
Finland	259	95	79	85	79	99	84	69	85	83	70	59	– 16	– 77	1
France	1 326	977	632	566	520	500	485	462	422	415	354	303	– 15	– 77	6
Germany	5 312	1 725	656	NE	NE	NE	NE	539	NE	NE	507	448	– 12	– 92	9
Greece	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	446	427	– 4	NE	8
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	93	NE	NE	2
Ireland	183	161	140	134	101	79	72	71	61	55	45	33	– 28	– 82	1
Italy	1 794	1 319	749	697	616	518	480	401	379	335	293	265	– 10	– 85	5
Latvia	105	49	16	12	11	9	7	7	6	6	5	4	– 14	– 96	0
Lithuania	214	88	NE	NE	NE	NE	NE	NE	NE	39	37	36	– 2	– 83	1
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	3	NE	NE	0
Malta	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Netherlands	192	130	73	75	68	64	66	65	64	61	51	38	– 25	– 80	1
Poland	NE	NE	1 511	1 564	1 455	1 375	1 241	1 222	1 222	1 216	995	861	– 13	NE	17
Portugal	292	306	281	261	259	174	175	176	155	149	108	80	– 26	– 73	2
Romania	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	566	460	– 19	NE	9
Slovakia	NE	NE	127	131	103	106	96	89	88	71	69	64	– 8	NE	1
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	13	12	– 10	NE	0
Spain	2 099	1 737	1 426	1 401	1 503	1 237	1 280	1 236	1 133	1 128	492	404	– 18	– 81	8
Sweden	105	69	42	41	40	41	37	36	36	33	30	30	– 2	– 72	1
United Kingdom	NE	NE	NE	NE	NE	NE	NE	697	663	586	498	397	– 20	NE	8
EU-27	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**5 034**	**NE**	**NE**	**100**

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

The EU-27 total for 2009 excludes data from Malta as Malta did not provide an emission estimate for this year.

Figure 3.6 Distance from ceiling for SO_2 emissions in 2009 and for projected SO_2 emissions in 2010 (with measures)

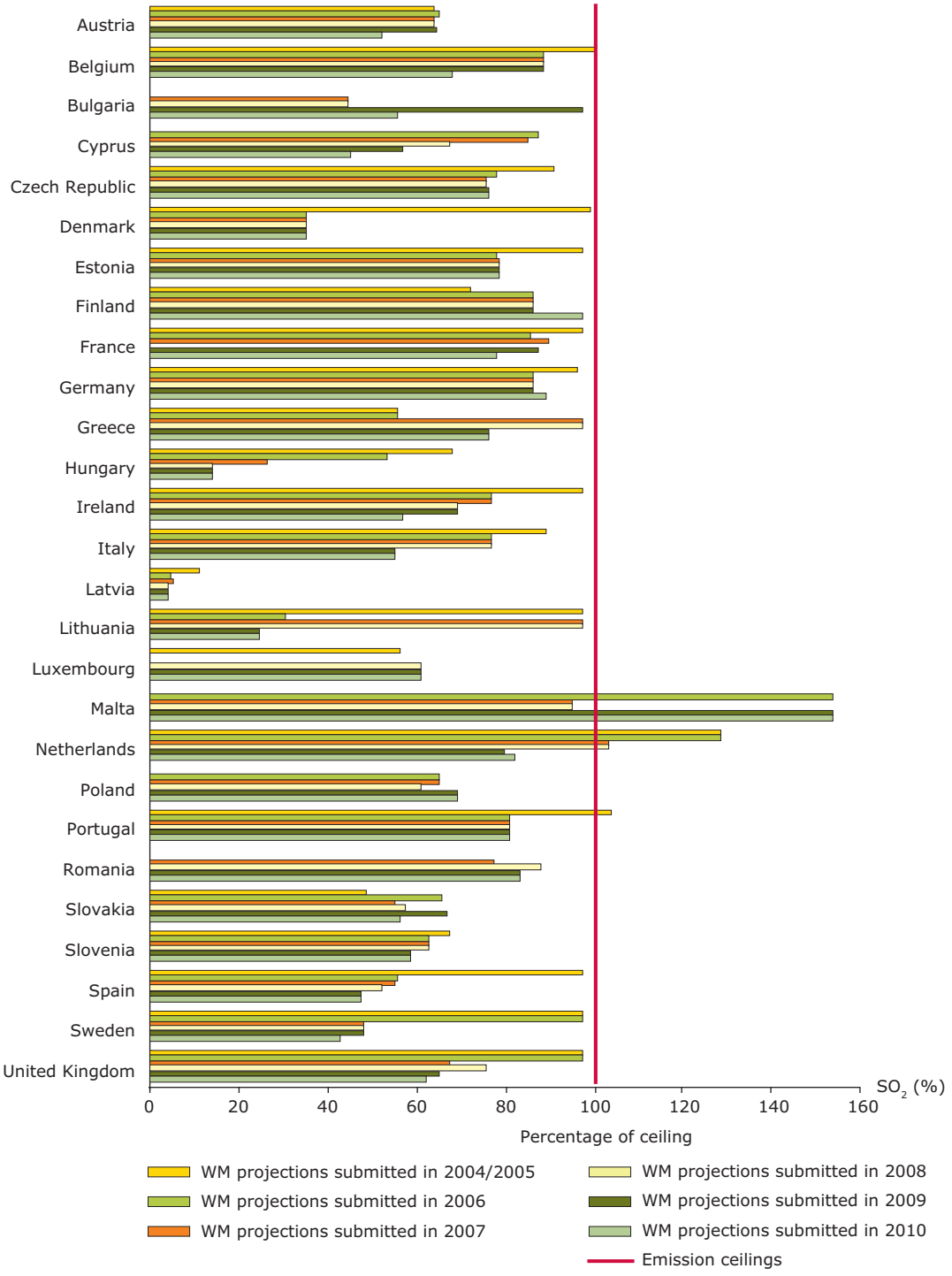


Note: Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

Latvia and Portugal mentioned in their IIR that their projection data were not updated.

Finland reported projection data identical to their emission ceilings.

Figure 3.7 Comparison of SO_2 projections (WM) submitted in 2005, 2006, 2007, 2008, 2009 and 2010, and ceilings in 2010



Note: Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

Latvia and Portugal mentioned in their IIR that their projection data were not updated.

Finland reported projection data identical to their emission ceilings.

3.5 NH_3 emissions and projections

For the EU-27, it was only possible to calculate a NH_3 emission total excluding Malta for 2009. For other years, data of several Member States were missing ([30]) (Table 3.7) although the submission of data for 2008 is a formal requirement under the NEC Directive.

Compared with 1990, emissions decreased in 13 Member States (from 15 Member States which reported 1990 and 2009 data). The largest emitters in 2009 were France, Germany and Italy.

Between 2008 and 2009, 16 of the 24 Member States that reported data, reported emission reductions. As emission estimates for 2008 and 2009 are missing for several Member States, the total change for the EU-27 could not be calculated. The highest absolute reductions between 2008 and 2009 were achieved in France and Poland.

For 22 Member States, NH_3 emissions in the year 2009 were already lower than their respective ceilings (Figure 3.8). Of the EU-27 Member States, 24 (same in 2009 submission) expect to be at, or below, their respective emission ceilings by 2010 (Figure 3.8). Bulgaria, Denmark and Finland reported WM projections identical to their 2010 NH_3 emission ceilings set in the NECD. As the emissions reported in 2009 for Bulgaria are already significantly below its 2010 ceilings, it seems likely that Bulgaria will indeed meet the 2010 NH_3 ceilings. Bulgaria, Lithuania and Portugal expect that NH_3 emission changes of more than 20 % have occurred between 2009 and 2010. Denmark, Finland, Germany and Spain had NH_3 emissions in 2009 higher than their emission ceiling.

No Member State submitted WM projections more than 20 % above the ceiling (Figure 3.8). WM projections submitted in the 2010 reporting round show that the largest exceedances above the NECD ceilings in absolute terms are expected in Germany (31 Gg) and Spain (28 Gg).

A comparison of NH_3 projections (WM) submitted in 2005, 2006, 2007, 2008, 2009 and 2010 (Figure 3.9) shows that the Czech Republic, Estonia and Lithuania changed their projections considerably during those years ([31]).

Compared with the projections submitted in 2009, five Member States revised their NH3 projections downwards in their 2010 submission. The highest relative change ([32]) was reported by Cyprus (– 14 %). Sixteen Member States have not changed their NH_3 projections since the 2009 submission, including Latvia and Portugal which mentioned explicitly in their IIR that their projection data were not updated and including the four Member States (Hungary, Malta, Romania and Spain), that have not sent projection data in the 2010 submission round.

([30]) As noted previously, the NECD does not require the reporting of emissions from 1990; however, Member States are encouraged to do so to enable an improved analysis of the emission trends.
([31]) The changes in reported projections were greater than 30 percentage points.
([32]) Changes of projections reported in 2009 and 2010 are expressed as 100 x (WM_{2010} — WM_{2009})/WM_{2009} (%), where WM_{2010} and WM_{2009} are 'with measures' projections for 2010 submitted in 2009 and 2010.

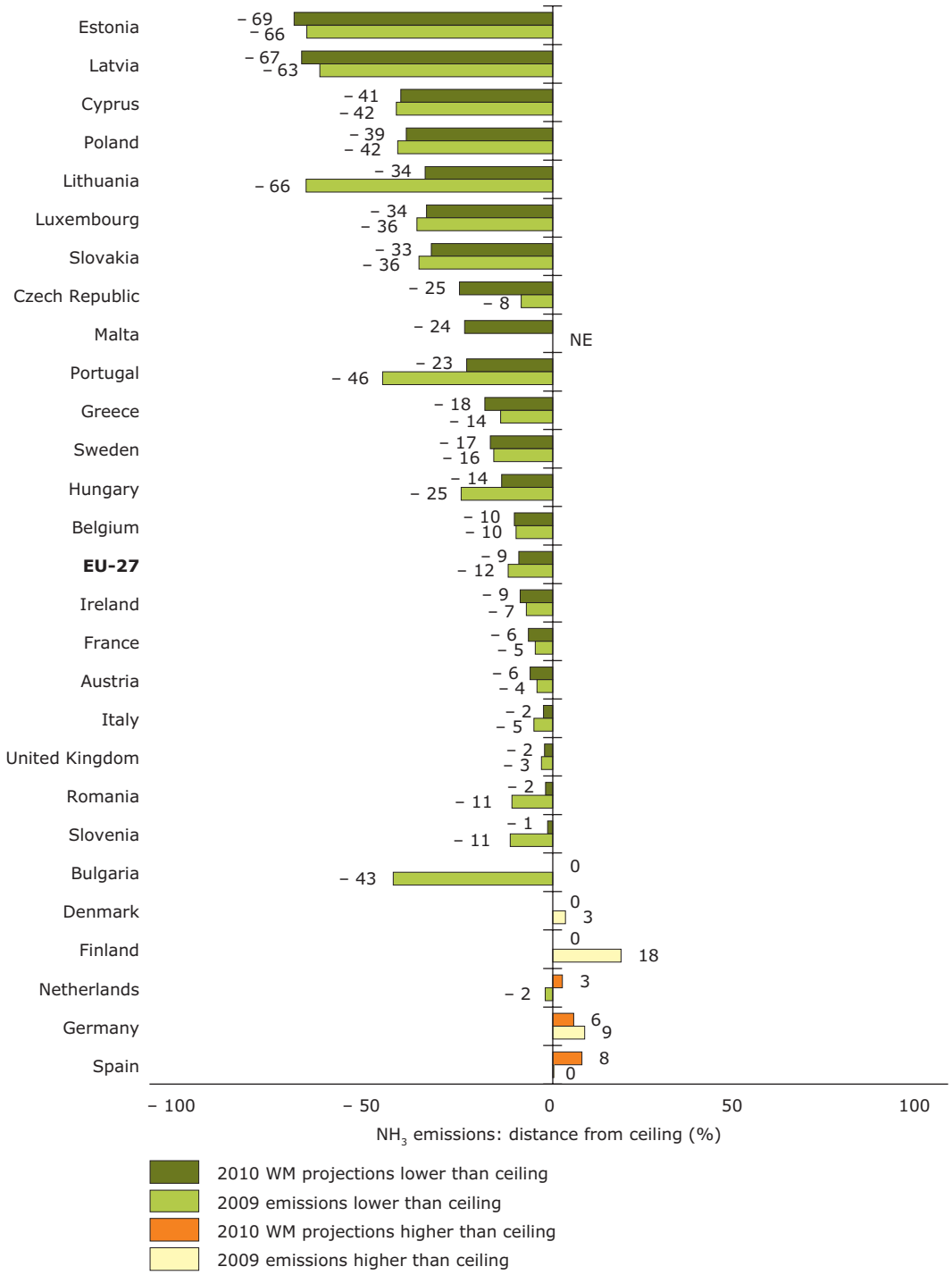
Table 3.7 NH_3 emission trends for Member States, 1990–2009

NH_3 (Gg)	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Change 2008–2009 (%)	Change 1990–2009 (%)	Contribution to EU-27 in 2009 (%)
Austria	65	71	65	65	63	63	62	62	62	63	62	63	1	– 3	2
Belgium	120	115	85	NE	NE	NE	NE	71	71	68	67	67	– 1	– 44	2
Bulgaria	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	58	62	6	NE	2
Cyprus	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	5	5	– 3	NE	0
Czech Republic	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	80	73	– 8	NE	2
Denmark	101	89	85	85	83	82	82	78	75	74	73	71	– 2	– 29	2
Estonia	25	11	10	10	9	10	10	10	10	10	11	10	– 8	– 60	0
Finland	40	37	37	36	37	38	38	39	39	38	38	37	– 3	– 8	1
France	791	774	802	789	791	763	756	751	745	744	760	744	– 2	– 6	20
Germany	700	599	594	NE	NE	NE	NE	578	NE	NE	584	597	2	– 15	16
Greece	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	63	63	– 1	NE	2
Hungary	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	68	NE	NE	2
Ireland	106	113	121	116	116	115	114	113	112	108	107	108	0	2	3
Italy	466	447	446	448	436	431	425	413	408	417	406	398	– 2	– 15	11
Latvia	48	16	13	15	14	15	15	16	16	16	16	16	0	– 66	0
Lithuania	84	38	NE	NE	NE	NE	NE	NE	NE	36	29	28	– 3	– 66	1
Luxembourg	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	4	NE	NE	0
Malta	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Netherlands	356	209	163	158	150	145	143	141	142	140	127	125	– 1	– 65	3
Poland	NE	NE	323	328	325	323	317	326	287	289	285	273	– 4	NE	7
Portugal	62	59	61	59	59	53	54	52	50	51	49	49	– 1	– 22	1
Romania	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	187	187	0	NE	5
Slovakia	NE	NE	32	32	33	32	29	29	27	27	25	25	– 1	NE	1
Slovenia	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	18	18	1	NE	0
Spain	316	309	377	378	375	389	383	364	375	385	354	354	0	12	9
Sweden	54	62	56	53	52	53	53	53	52	50	50	48	– 3	– 11	1
United Kingdom	NE	NE	NE	NE	NE	NE	NE	311	311	302	288	288	0	NE	8
EU-27	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**NE**	**3 783**	**NE**	**NE**	**100**

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

The EU-27 total for 2009 excludes data from Malta as Malta did not provide an emission estimate for this year.

Figure 3.8 Distance from ceiling for NH_3 emissions in 2009 and for projected NH_3 emissions in 2010 (with measures)

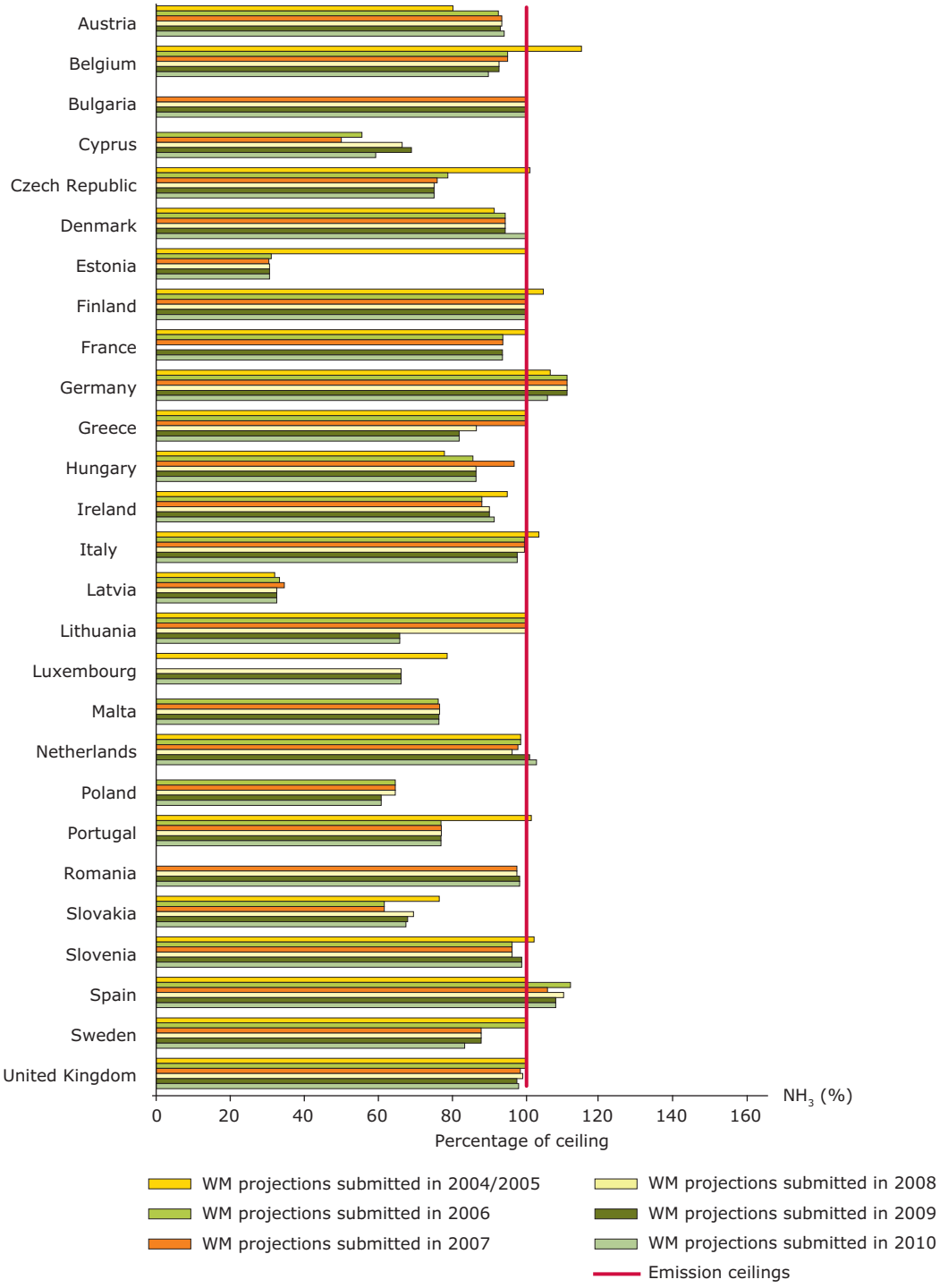


Note: Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

Latvia and Portugal mentioned in their IIR that their projection data were not updated.

Bulgaria, Denmark and Finland reported projection data identical to their emission ceilings.

Figure 3.9 Comparison of NH_3 projections (WM) submitted in 2005, 2006, 2007, 2008, 2009 and 2010, and ceilings in 2010



Note: Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.

Latvia and Portugal mentioned in their IIR that their projection data were not updated.

Bulgaria, Denmark and Finland reported projection data identical to their emission ceilings.

4 Potential underestimation of Member State emissions due to non-reporting of sectors

4.1 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 'not estimated' (NE) for those 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 be costly to develop a specific estimation methodology compared with improving estimates for more significant sources.

In the previous NECD status report (EEA, 2010a) a simple assessment was made of possible underestimation in national emission inventories that may occur due to the use of the notation key 'NE' by Member States. This analysis was repeated again in this year's assessment. A main intention of the analysis is to encourage Member States to review the source categories that are reported as 'NE' and in future provide estimates, especially where these sources may add significantly to the currently reported national totals.

A complete 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 most important that Member States report complete emission datasets.

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.

A separate analysis was also performed for this year's report in order to assess the number of Member States that report emissions from certain pollutant/source category combinations that were not included in the original modelling undertaken to support the determination of the 2010 emissions ceilings. These combinations were:

- NO_x and NMVOC emissions from the Agriculture sector (NFR code 4); and
- NMVOC emissions from the 'Food and drink' sector (NFR code 2 D 2).

4.2 Assessment method

In assessing the importance of source 3 categories reported as 'NE', Member States were assigned to one of two general 'eastern' and 'western' groupings ([33]). For each group, the average contribution made to total emissions in 2009 by the specific NFR source categories was estimated. Source categories reported as 'NE' in national inventories were then assumed to contribute (in percentage terms) as much to the national total of the Member State as the mean contribution made by the same source sector to the aggregated total for the respective country group. In a final step the potential underestimated emissions arising from use of the 'NE' notation key were added to the 2009

([33]) 'Eastern Member States' were defined as: Bulgaria, Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. 'Western Member States' are defined as: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

national total of the Member States and compared with the ceilings within the NECD to see whether the difference in emission is likely to affect the number of Member States attaining their ceilings or not.

This relatively simple approach might be considered to provide a somewhat higher estimate of the emissions than the actual value, as Member States that report source categories as 'NE' are more likely to have a smaller share of national emissions from these source categories than those Member States that do report emission values.

Emission factors or notation keys are not provided for all source categories and gases in the UNECE guidelines for reporting emission data under the LRTAP Convention (UNECE, 2009).

4.3 Assessment results

Certain Member States used the notation key 'NE' for a considerable number of source categories (Table 4.1). Spain, for example, reported 'NE' for 39 source categories of NH_3. In contrast, a number of Member States used 'NE' for only a limited number of source categories (or for no source category at all).

Table 4.1 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 is only one case where the potential underestimation is above 10 % (Lithuania, NMVOC). In general, it seems that for NO_X and SO_2 the potential underestimation is lower than for NMVOC and NH_3.

For almost all 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 in 2009. Only for Italy (NO_X) does the addition of the underestimation increase its 2009 emissions above the level of the respective 2010 ceiling.

Compared with the 2009 submissions, Denmark, Italy and Lithuania show a strong increase (change of more than five) in the use of the notation key 'NE' (Denmark and Lithuania for all pollutants and Italy only for NO_X). In contrast, Belgium, the Czech Republic and Cyprus show a strong decrease (change of more than 10) in the use of the notation key 'NE' for NO_X, and additionally the Czech Republic for NMVOC.

Thirteen Member States provided reasons for the 'NE' emissions in their data submissions under the NECD. Note that Member States might provide more information under their LRTAP Convention submissions. The information provided was, however, of rather varying informative value.

4.4 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 source categories for the pollutants covered within the scope of the NECD have been recognised and on the basis of subsequent measurements, emission factors have been developed that now enable emission estimates to be made.

As a result, a number of Member States, but not all, now report emissions from 'new' pollutant/source category combinations that were not included in the original modelling. These combinations include for example:

- NO_X and NMVOC emissions from the Agriculture sector (NFR code 4); and
- NMVOC emissions from the 'Food and drink' sector (NFR code 2 D 2).

The EMEP/EEA Guidebook (EMEP/EEA, 2009) provides Member States with default methodologies and emission factors that they can use in order to estimate emissions. Not all the 'new' pollutant/source combinations have a default method with default emission factors defined in the Guidebook (e.g. NMVOC from certain agriculture sub-sectors). This occurs for example, when there is not yet deemed sufficient scientific evidence available in order that an emission factor suitable for use across Europe can be recommended. 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 these selected 'new' source categories, and to determine the significance of these emissions with respect to the reported national totals and national emissions ceilings. The detailed results of the analyses undertaken are provided in Appendix 3.

4.4.1 NMVOC emissions from the Agriculture sector

In 2009, 16 Member States reported data for NMVOC in the sector Agriculture (Table A3.1), although eight reported data for only one of the various Agriculture source categories. Cyprus, Estonia, Italy, Germany and Romania submitted data for the highest number of source categories (7–10).

For the Member States reporting NMVOC emissions from this sector, the emission as a fraction of the total emission reported are sometimes very significant i.e. (Cyprus (21.5 %), Germany (19.9 %), Bulgaria (19.7 %), Romania (16.6 %) and Estonia (10.0 %)).

Similarly, the reported 2009 emissions often comprised a notable fraction of the respective emission ceiling for NMVOC in some of the Member States (Germany (25.8 %), Cyprus (17.1 %), Bulgaria (15.2 %) and Romania (13.8 %)).

4.4.2 NO_X emissions from the Agriculture sector

Thirteen Member States reported data for NO_X in the sector Agriculture (Table A3.2), although again eight countries reported data only for one of the Agriculture source categories. Germany, Austria, Cyprus and Romania submitted data for the highest number of categories (8–15). In 2009 NO_X emissions in the sector Agriculture corresponded to 13.7 % and 5.6 % of the emission ceiling for NO_X in Germany and Austria respectively. The share of national total NO_X emissions that was attributed to Agriculture was 10.5 % and 4 % for Germany and Austria respectively. In other Member States NO_X emissions from Agriculture comprised only a relatively small share (below 2.1 %) of total NO_X emissions in 2009.

4.4.3 NMVOC emissions from the Food and drink sector

For NMVOC emissions from the category '2 D 2 — Food and drink' reporting was more complete than for NMVOC and NO_X emissions from Agriculture (Table A3.3). Twenty-three Member States reported data for NMVOC in the category '2 D 2 — Food and drink'. Only Cyprus, Ireland, Luxembourg and Malta did not report emissions from this sector. NMVOC emissions for 2009 from this source category corresponded to around 10 % of the NMVOC emission ceiling in Denmark and Lithuania and to 6.8 % in the United Kingdom. The share of national total NMVOC emissions that was attributed to '2 D 2 — Food and drink' ranged between 9.1 % and 12.9 % for these three Member States. In other Member States NMVOC emission from the category '2 D 2 — Food and drink' corresponded to around 6.4 % of the total NMVOC emissions for 2009.

Table 4.1 Number of source categories that are 'not estimated' and an indication of the contribution of these source categories to the reported total emissions of Member States for NO_x, NMVOC, SO_2 and NH_3

	NO_x				NMVOC				SO_2				NH_3			
	Number of source categories NE	Potential underesti-mation of emissions (%)	Are 2009 emissions lower than ceiling?	Are 2009 emissions + potential underesti-mation lower than ceiling?	Number of source categories NE	Potential underesti-mation of emissions (%)	Are 2009 emissions lower than ceiling?	Are 2009 emissions + potential underesti-mation lower than ceiling?	Number of source categories NE	Potential underesti-mation of emissions (%)	Are 2009 emissions lower than ceiling?	Are 2009 emissions + potential underesti-mation lower than ceiling?	Number of source categories NE	Potential underesti-mation of emissions (%)	Are 2009 emissions lower than ceiling?	Are 2009 emissions + potential underesti-mation lower than ceiling?
Austria	2	0	NO	NO	2	2	YES	YES	2	0	YES	YES	2	0	YES	YES
Belgium	14	3	NO	NO	19	5	YES	YES	11	1	YES	YES	18	1	YES	YES
Bulgaria	21	1	YES	YES	22	9	YES	YES	21	0	YES	YES	21	3	YES	YES
Cyprus	14	1	YES	YES	12	6	YES	YES	14	0	YES	YES	18	6	YES	YES
Czech Republic	1	0	YES	YES	2	4	YES	YES	1	0	YES	YES	1	0	YES	YES
Denmark	**27**	2	NO	NO	**25**	6	NO	NO	**12**	3	YES	YES	**23**	1	NO	NO
Estonia	1	0	YES	YES	1	0	YES	YES	1	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	1	0	NO	NO	2	0	YES	YES	1	0	YES	YES	1	0	YES	YES
Germany	7	0	NO	NO	10	0	NO	NO	5	0	YES	YES	5	2	NO	NO
Greece	9	1	NO	NO	12	3	YES	YES	7	1	YES	YES	0	0	YES	YES
Hungary	0	0	YES	YES	0	0	YES	YES	0	0	YES	YES	0	0	YES	YES
Ireland	6	0	NO	NO	6	3	YES	YES	6	1	YES	YES	33	2	YES	YES
Italy	**16**	1	YES	NO	1	0	YES	YES	1	0	YES	YES	1	0	YES	YES
Latvia	2	0	YES	YES	3	4	YES	YES	2	0	YES	YES	23	2	YES	YES
Lithuania	**14**	1	YES	YES	**23**	17	YES	YES	**13**	0	YES	YES	**33**	10	YES	YES
Luxembourg	2	0	NO	NO	2	0	YES	YES	2	0	YES	YES	2	0	YES	YES
Malta																
Netherlands	5	0	NO	NO	1	0	YES	YES	2	0	YES	YES	5	1	YES	YES
Poland	3	1	YES	YES	2	1	YES	YES	2	1	YES	YES	1	1	YES	YES
Portugal	9	0	YES	YES	10	2	NO	NO	11	1	YES	YES	15	0	YES	YES
Romania	13	0	YES	YES	19	2	YES	YES	12	0	YES	YES	16	3	YES	YES
Slovakia	2	0	YES	YES	3	0	YES	YES	2	0	YES	YES	7	0	YES	YES
Slovenia	31	2	NO	NO	32	6	YES	YES	31	1	YES	YES	22	7	YES	YES
Spain	18	1	NO	NO	29	4	NO	NO	22	2	YES	YES	39	6	NO	NO
Sweden	4	0	NO	NO	16	4	YES	YES	5	0	YES	YES	15	0	YES	YES
United Kingdom	1	0	YES	YES	2	0	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 Member States that submitted their inventories in older NFR formats. Therefore, in these instances the number of source categories that were not estimated presented in the table above could vary slightly from the number originally reported by Member States

Bold numbers: Number of the notation key 'NE' increased by more than five compared with the submissions of 2009.

5 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. The recommendations are directed towards improving the quality and transparency of national inventories and projections reported under the NECD. The objectives to be achieved are:

- **higher quality emission inventories and projections** enabling an accurate monitoring of progress towards the ceilings and an earlier and more accurate definition of any further emission reduction policies and measures, thus facilitating potentially lower costs for compliance solutions;

- **greater harmonisation of international reporting requirements**, thereby reducing the administrative burden for Member States and facilitating greater consistency in assumptions and relevant parameters.

It is also important that there is improved transparency regarding measures taken by Member States and the contribution of these measures to compliance with the national emission ceilings, e.g. increasing the standards for best available techniques (BAT) or specific additional requirements for certain types of industry or agriculture.

5.1 Trends and projected emissions

The majority of the EU Member States for which data back to 1990 are available report considerable emission reductions of the four NECD pollutants since 1990. Several countries have already succeeded in reducing emissions below their 2010 emission ceilings in line with the requirements of the NECD (see projections in Figures 3.2, 3.4, 3.6 and 3.8).

NO_x emissions continue to pose the greatest challenge, with eleven Member States predicting they will miss their national ceilings. Projected emissions for the EU-27 ([34]) are 6 % above the aggregated ceiling calculated as the sum of individual Member States' Annex I ceilings (and 17 % above the EU-27 Annex II NECD ceiling). The exceedances above the NECD ceilings in absolute values are largest for 'with measures' projections submitted in the 2010 reporting round for Germany (328 Gg) ([35]) and France (275 Gg). Austria, Belgium, France, Germany, Ireland and Spain submitted 'with measures' projections more than 20 % above their respective ceilings.

Progress in reducing NMVOC emissions seems to have been more successful. Even if four Member States, according to their submitted 'with measures' projections, will not meet the ceilings in 2010, NMVOC projections for the EU-27 are 14 % below the aggregated ceiling, and marginally below the Annex II ceiling. Highest exceedances above the NECD ceilings are expected by Germany (335 Gg) ([36]) and Spain (116 Gg). Germany submitted 'with measures' projections more than 20 % above its respective ceilings, which is a major change to its estimate in 2009, where they were projected to be – 1 % below its ceiling. Germany has indicated in its IIR that it is presently reviewing emission factors for certain sectors e.g. for the Oil and Gas sector. This may result in changes to future reported emission levels.

([34]) Projection data of Spain, Hungary, Malta and Romania are data submitted under the NECD during the 2009 reporting round, as these Member States submitted no projection data during the 2010 reporting round.
([35]) Germany also provided a 145 Gg lower estimate for NO_x emissions that does not include source categories 4 'Agriculture' as these sources were not taken into account when setting the original NEC ceilings.
([36]) Germany also provided a 278 Gg lower estimate for NMVOC emissions that does not include source categories 4 'Agriculture' and 2D2 'Food and drink' as these sources were not taken into account when setting the original NEC ceilings.

All Member States except Malta expect to be at, or below, their respective SO_2 ceilings in 2010 according to 'with measures' projections. The EU-27 as a whole is projected to be 35 % below the aggregated ceiling. The Annex II ceiling for SO_2 should also be achieved (projected emissions are 31 % below).

The NH_3 projections for the EU-27 are 9 % under the aggregated emission ceiling of Annex I to the NECD. Three Member States predict that they will miss their national ceilings. WM projections submitted in the 2010 reporting round show that the highest exceedances above the NECD ceiling in absolute terms are expected in Germany (31 Gg) and Spain (28 Gg).

Based on the 'with measures' projection data, it is clear that only 14 Member States forecast that they will meet their ceilings for all pollutants.

A comparison of projections (WM) submitted in 2005, 2006, 2007, 2008, 2009 and 2010 (Figures 3.3, 3.5, 3.7 and 3.9) shows that several Member States have made considerable changes to the projection data reported in these years. As Member States are not required to explain changes under the NECD, the reasons for the past changes in the projections are generally not known.

The revision of the projection data submitted in 2010 in individual countries resulted in decreased projections for SO_2 (– 432 Gg) and NH_3 (– 24 Gg) and increased projections for NO_X (+ 209 Gg) and NMVOC (+ 6 Gg) for the EU-27. Bulgaria contributed notably to the pronounced revision of the SO_2 projections.

A number of Member States used the notation key 'NE' to signify that emissions from specific source categories were not estimated. Generally, the potential underestimation occurring as a result of this (in percentage terms) is low for all pollutants. There is only one case where the potential underestimation is above 10 % (Lithuania, NMVOC). Only for one Member State, Italy (NO_X), does the addition of the underestimated emissions increase its 2009 emissions above the level of the respective 2010 ceiling. Member States are encouraged to review their use of 'NE' when reporting emission data, and to provide numerical estimates where resources allow adequate estimates to be made.

5.2 Data reporting issues

5.2.1 Timeliness and completeness

With the exception of Malta, which has not yet provided a 2010 submission, the timeliness of reporting is largely comparable to the previous NECD reporting cycle. Twenty-four Member States provided inventories by the required deadline, compared with 23 in the previous cycle. However, submissions did not always contain all the formally required data. Only twenty-three Member States submitted 2010 projections in the 2010 reporting round and only 24 Member States provided the mandatory information on final emissions for the year 2008. Eleven Member States (including the four Member States that have not sent any projection data) did not revise their respective 2010 emission projections for any of the four NEC pollutants.

5.2.2 Consistency and comparability

All Member States used the NFR format for reporting of their emissions. Twenty-two Member States submitted their inventories only in the NFR09 format, three Member States used only older NFR formats and one Member States used a combination of NFR09 and older formats (for different years). The consistency of reporting improved slightly compared with last year, but use of older reporting formats continues to create processing problems when compiling submissions and in checking the consistency and completeness of data.

5.2.3 Transparency of submitted information

Nine Member States (Austria, Finland, Germany, Latvia, Poland, Portugal, Slovakia, Spain and Sweden) voluntarily submitted an inventory report together with their inventories ([37]). Similarly, only 13 Member States (Austria, Estonia, Finland, Greece, Ireland, Latvia, Lithuania, the Netherlands, Poland, Portugal, Slovakia, Slovenia, and the United Kingdom) reported the key socioeconomic data used in preparing their projections, despite this being a formal requirement of the NECD.

([37]) 17 Member States submitted informative inventory reports (IIRs) under the LRTAP Convention until5 April 2011.

5.3 Suggested improvements

To help improve the transparency of the reported NECD data, part of the formal inventory reporting by the Member States should, in the future, involve submitting an accompanying inventory report, for example under a future revised NECD. Such a report should include the explanatory information concerning the reported inventory, for example whether countries report on the basis of fuel used or sold (to prevent double counting or omissions when compiling the EU-27 inventory) ([38]).

Member States are invited to provide updated information on their 1990 and 2000 emissions so as to enable better evaluation of trends; similarly an overview of recalculations could be made (particularly with regard to the previous year's submission) including quantitative information and brief explanations for any recalculations performed.

The importance of providing inventories in **standardised formats** has been repeatedly stressed by the European Commission and the EEA in their communications with Member States. The need each year to transfer reported data provided in older reporting formats is both time-consuming and a potential source of errors. The mandatory use of a common inventory reporting format should be considered for inclusion in any future amended NECD.

([38]) Twelve Member States reported in addition to the 'National total', a 'National total' based on fuel used. However, for eight Member States the data given as 'National total' based on fuel used are identical with the 'National total'. Still, it does not seem that all Member States that report identical numbers for 'National total' and 'National total' based on fuel used actually base their 'National total' on the fuel that was used. Some Member States indicate in the ''Additional information'' sheet of the NFR09 template that emissions from road transport are based on fuel sold.

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Units and abbreviations

Gg	1 gigagram = 10^9 g = 1 kiloton (kt)
BAU	(projections) business as usual
CAFE	Cleaner Air for Europe
CEIP	EMEP Centre on Emission Inventories and Projections
CDR	Eionet Central Data Repository
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CLS	current legislation projections
CRP	current reduction projections
CRF	common reporting format (UNFCCC)
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
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
QA/QC	quality assurance/quality control
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
VOCs	volatile organic compounds (non-methane)
WAM	(projections) with additional measures
WM	(projections) with measures
WOM	(projections) without measures

Appendix 1 Data sources

Table A1.1 Overview of emission data sources used in the trend tables (Tables 3.4 to 3.7), as of 5 April 2011

Member State	1990	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Austria	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Belgium	SUBM10	SUBM10					SUBM10					SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Bulgaria															SUBM10	SUBM10
Cyprus															SUBM10	SUBM10
Czech Republic															SUBM10	SUBM10
Denmark	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Estonia	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Finland	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
France	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Germany	SUBM10	SUBM10					SUBM10					SUBM10			SUBM10	SUBM10
Greece															SUBM10	SUBM10
Hungary																SUBM10
Ireland	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Italy	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Latvia	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Lithuania	SUBM10	SUBM10												SUBM10	SUBM10	SUBM10
Luxembourg																SUBM10
Malta																
Netherlands	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Poland							SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Portugal	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Romania															SUBM10	SUBM10
Slovakia							SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Slovenia															SUBM10	SUBM10
Spain	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
Sweden	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10	SUBM10
United Kingdom												SUBM10	SUBM10	SUBM10	SUBM10	SUBM10

Note: SUBM10 = inventory submission with the reporting deadline on 31 December 2010.

Table A1.2 Overview of Member State WM and WAM emission projection data sources, as of 5 April 2011

Member State	2010 — with measures	2010 — with additinal measures
Austria *	NFR09, Table 2a (2010)	
Belgium	NFR09, Table 2a (2010)	
Bulgaria	NFR09, Table 2a (2010)	
Cyprus	NFR09, Table 1 (2010)	
Czech Republic	NFR09, Table 2a (2010)	
Denmark	NFR02, Table 2a (2010)	
Estonia	NFR09, Table 2a (2010)	
Finland	IIR (2010) + notification letter + NFR09, Table 2a (2010)	
France	NFR09, Table 2a (2010)	
Germany	NFR02, Table 2a modified (2010)	
Greece	NFR09, Table 2a (2010)	
Hungary	NFR09, Table 2a modified (2009)	
Ireland	NFR09, Table 2a (2010)	NFR09, Table 2a (2010)
Italy	Excel table (2010)	
Latvia	NFR09, Table 2a modified (2010)	
Lithuania	NFR09, Table 2a (2010)	
Luxembourg	NFR09, Table 2a (2010)	NFR09, Table 2a (2010)
Malta *	NFR09, Table 2a (2009)	
Netherlands	NFR09, Table 2a (2010)	
Poland	NFR09, Table 2a (2010)	
Portugal	NFR09, Table 2a (2010)	
Romania	NFR09, Table 2a (2009)	
Slovakia	NFR09, Table 2a (2010)	NFR09, Table 2a (2010)
Slovenia	NFR09, Table 2a (2010)	
Spain *	NFR09, Table 2a (2009)	
Sweden	NFR09, Table 2a modified (2010)	
United Kingdom	NFR09, Table 2a (2010)	

Note: 'NFR' denotes 'nomenclature for reporting' — the sectoral classification system developed by UNECE/EMEP for reporting air emissions. The table numbers refer to the table numbering of the NFR reporting template. NFR09 is the most recent version of the reporting template. Definitions for WM and WAM projections are provided in Chapter 3 of this report.

'*' Following finalisation of this report, new projections from Austria, Malta and Spain were received.

Appendix 2 Status of reporting

Table A2.1 NECD emissions and projections, 2010 reporting round, as of 5 April 2011

Member State	Submission		Resub-missions	Years covered	Format	NO_x, NMVOC, SO_2, NH_3		Projections table	socio-economic data	IIR
	uploaded to CDR	to the EC				2008 final	2009 preliminary			
Austria *	29.12.2010			1990–2009	NFR 2009-1	x	x	2010, 2015, 2020, 2030	x	29.12.2010
Belgium	21.12.2010			1990, 1995, 2000, 2005–2009	NFR 2009-1	x	x	2010		np
Bulgaria	30.12.2010			2008–2009	NFR 2009-1	x	x	2010, 2015		np
Cyprus	28.12.2010		07.02.2011	2008–2009	NFR 2009-1	x	x	2010		np
Czech Republic	21.12.2010			2008–2009	NFR 2009-1	x	x	2010		np
Denmark	10.12.2010			1980–2009	NFR 2009-1	x	x	2010, 2015, 2020, 2030		np
Estonia	30.12.2010		15.02.2011	1990–2009	NFR 2009-1	x	x	2010, 2015	x	np
Finland	14.12.2010		16.02.2011	1980–2009	1980-2006: NFR 2004-1, 2007-2009: NFR 2009-1	x	x	2010, 2020, 2050	x	14.12.2010, 15.03.2011
France	23.12.2010			1980–2009	NFR 2009-1	x	x	2010, 2015, 2020		np
Germany	22.12.2010		31.01.2011	1990, 1995, 2000, 2005, 2008–2009	NFR 2009-1	x	x	2010		31.01.2011
Greece	21.01.2011		25.01.2011	2008–2009	NFR 2009-1	x	x	2010, 2015, 2020	x	np
Hungary	21.12.2010			2009	NFR 2008-1	np	x	np		np
Ireland	17.12.2010		31.03.2011	1990–2009	NFR 2009-1	x	x	2010	x	np
Italy	31.12.2010			1990–2009	NFR 2008-1	x	x	2010, 2015, 2020, 2030		np
Latvia	29.12.2010		04.04.2011	1990–2009	NFR 2009-1	x	x	2010, 2015, 2020	x	29.12.2010, 04.04.2011
Lithuania	17.12.2010		21.01.2011	1990, 1995, 2007–2009	NFR 2009-1	x	x	2010, 2015, 2020	x	np
Luxembourg	31.12.2010			2009	NFR 2009-1	np	x	2010		np
Malta *				np	np	np	np	np		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.
'*' Following finalisation of this report, new projections from Austria, Malta and Spain were received.

Table A2.1 NECD emissions and projections, 2010 reporting round, as of 5 April 2011 (cont.)

Member State	Submission		Resub-missions	Years covered	Format	NO_x, NMVOC, SO_2, NH_3		Projections table	socio-economic data	IIR
	uploaded to CDR	to the EC				2008 final	2009 preliminary			
Netherlands	23.12.2010		15.02.2011	1990–2009	NFR 2009-1	x	x	2010, 2015, 2020, 2030	x	np
Poland	10.12.2010		29.03.2011	2000–2009	NFR 2009-1	x	x	2010	x	10.12.2010, 29.03.2011
Portugal	31.12.2010			1990–2009	NFR 2008-1	x	x	2010, 2020	x	21.01.2011
Romania	29.12.2010			2008–2009	NFR 2009-1	x	x	np		np
Slovakia	22.12.2010			2000–2009	NFR 2009-1	x	x	2010, 2015, 2020, 2030, 2050	x	22.12.2010
Slovenia	10.01.2011			2008–2009	NFR 2009-1	x	x	2010, 2015, 2020	x	np
Spain *	30.12.2010		01.04.2011	1990–2009	NFR 2009-1	x	x	np		30.12.2010
Sweden	21.12.2010		15.02.2011	1990–2009	NFR 2009-1	x	x	2010, 2015, 2020, 2030		21.12.2010
United Kingdom	16.12.2010		24.12.2010	2005–2009	NFR 2009-1	x	x	2010	x	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.
'*' Following finalisation of this report, new projections from Austria, Malta and Spain were received.

Appendix 3 Member States' reporting of NO_x and NMVOC emissions from the 'Agriculture' sector, and NMVOC from the 'Food and drink' sector

Table A3.1 Status of reporting: NMVOC emissions from the sector Agriculture

NMVOC Agriculture		2008 emissions	2009 emissions	% of ceiling (2009)	% of national total (2009)	No of countries that reported values	No of countries that reported 'IE'	No 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					5	0	21	T1	Yes
	Cyprus	0.32	0.32	2.25 %	2.84 %					
	Estonia	1.32	1.32	2.68 %	3.62 %					
	Germany	89.1	88.9	8.93 %	6.92 %					
	Italy	0.11	0.11	0.01 %	0.01 %					
	Romania	22.3	19.6	3.75 %	4.54 %					
4 B 1 b	Cattle Non-dairy					5	0	21	T1	Yes
	Cyprus	0.24	0.23	1.64 %	2.07 %					
	Estonia	1.02	1.02	2.08 %	2.81 %					
	Germany	54.1	54.0	5.43 %	4.20 %					
	Italy	0.26	0.26	0.02 %	0.02 %					
	Romania	7.73	6.98	1.33 %	1.61 %					
4 B 2	Buffalo					1	0	25	No	Yes
	Italy	0.02	0.01	0.001 %	0.001 %					
4 B 3	Sheep					5	0	21	T1	Yes
	Cyprus	0.04	0.04	0.32 %	0.40 %					
	Estonia	0.02	0.02	0.03 %	0.04 %					
	Germany	1.82	1.76	0.18 %	0.14 %					
	Italy	0.04	0.04	0.004 %	0.004 %					
	Romania	1.78	1.83	0.35 %	0.42 %					
4 B 4	Goats					3	1	22	T1	Yes
	Cyprus	0.05	0.04	0.25 %	0.32 %					
	Italy	0.005	0.005	< 0.001 %	< 0.001 %					
	Romania	0.18	0.18	0.03 %	0.04 %					
4 B 6	Horses					2	0	24	No	Yes
	Estonia	0.02	0.02	0.03 %	0.04 %					
	Italy	0.01	0.01	< 0.001 %	< 0.001 %					
4 B 7	Mules and asses					1	1	24	No	Yes
	Italy	0.001	0.001	< 0.001 %	< 0.001 %					
4 B 8	Swine					5	0	21	T1	Yes
	Cyprus	1.24	1.23	8.77 %	11.06 %					
	Estonia	0.90	0.90	1.84 %	2.49 %					
	Germany	85.2	87.2	8.76 %	6.78 %					
	Italy	0.16	0.16	0.01 %	0.01 %					
	Romania	27.6	26.0	4.97 %	6.01 %					
4 B 9 a	Laying hens					4	1	21	T1	Yes
	Cyprus	0.18	0.18	1.30 %	1.63 %					
	Estonia	0.20	0.20	0.41 %	0.55 %					
	Germany	11.0	12.0	1.20 %	0.93 %					
	Romania	13.7	13.5	2.58 %	3.13 %					
4 B 9 b	Broilers					4	2	20	T1	Yes
	Cyprus	0.33	0.32	2.27 %	2.86 %					
	Estonia	0.11	0.11	0.23 %	0.30 %					
	Germany	8.51	8.83	0.89 %	0.69 %					
	Romania	3.88	3.88	0.74 %	0.90 %					

Table A3.1 Status of reporting: NMVOC emissions from the sector Agriculture (cont.)

NMVOC Agriculture		2008 emissions	2009 emissions	% of ceiling (2009)	% of national total (2009)	No of countries that reported values	No of countries that reported 'IE'	No of countries that used other entries *	Emission factor in EMEP/ EEA GB available	Method in EMEP/ EEA GB available
4 B 9 c	Turkeys					1	2	23	T1	Yes
	Cyprus	0.02	0.01	0.09 %	0.12 %					
4 B 9 d	Other poultry					2	0	24	T1	Yes
	Estonia	0.04	0.04	0.08 %	0.11 %					
	Germany	1.29	1.27	0.13 %	0.10 %					
4 B 13	Other					0	0	26	No	Yes
4 D 1 a	Synthetic N-fertilizers					7	0	19	T1	Yes
	Bulgaria	19.9	19.9	11.34 %	14.68 %					
	Cyprus	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Estonia	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Germany	2.19	2.29	0.23 %	0.18 %					
	Latvia	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Luxembourg	–	0.18	2.04 %	2.21 %					
	Poland	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
4 D 2 a	Farm-level agricultural operations including storage, handling and transport of agricultural products					1	0	25	T1	Yes
	Ireland	3.25	3.25	5.91 %	6.23 %					
4 D 2 b	Off-farm storage, handling and transport of bulk agricultural products					0	0	26	T1	Yes
4 D 2 c	N-excretion on pasture range and paddock unspecified					0	0	26	T1	Yes
4 F	Field burning of agricultural wastes					8	0	18	T1, T2	Yes
	Austria	0.10	0.10	0.07 %	0.09 %					
	Bulgaria	6.83	6.83	3.90 %	5.05 %					
	Cyprus	0.02	0.02	0.17 %	0.21 %					
	Denmark	0.27	0.32	0.37 %	0.34 %					
	Italy	0.65	0.62	0.05 %	0.06 %					
	Poland	0.45	0.45	0.06 %	0.07 %					
	Portugal	3.95	3.98	2.21 %	2.18 %					
	Spain	47.6	47.6	7.20 %	7.08 %					
4 G	Agriculture other					3	0	23	No	Yes
	Austria	1.84	1.73	1.09 %	1.42 %					
	Netherlands	0.16	0.16	0.09 %	0.11 %					
	Slovakia	0.44	0.44	0.31 %	0.67 %					

Note: * 'Other entries' includes zero, empty cells and notation keys NE, NA, NO.

'T1' and 'T2' refer to the availability of 'Tier 1' and Tier 2' emission factors in the EMEP/EEA Air Pollutant Emission Inventory Guidebook (EMEP/EEA, 2009)

The assessment excludes Malta for which no data submission was received.

Table A3.2 Status of reporting: NO_x emissions from the sector Agriculture

NO_x Agriculture		2008 emissions	2009 emissions	% of ceiling (2009)	% of national total (2009)	No of countries that reported values	No of countries that reported 'IE'	No 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					5	0	21	No	Yes
	Austria	1.49	1.50	1.45 %	1.03 %					
	Cyprus	0.01	0.01	0.02 %	0.03 %					
	Germany	0.65	0.65	0.06 %	0.05 %					
	Netherlands	3.36	3.39	1.30 %	1.23 %					
	Romania	0.20	0.06	0.01 %	0.02 %					
4 B 1 b	Cattle Non-dairy					4	1	21	No	Yes
	Austria	1.93	1.97	1.91 %	1.35 %					
	Cyprus	0.005	0.004	0.02 %	0.02 %					
	Germany	0.52	0.52	0.05 %	0.04 %					
	Romania	0.06	0.00	< 0.001 %	< 0.001 %					
4 B 2	Buffalo					1	0	25	No	Yes
	Germany	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
4 B 3	Sheep					4	2	20	No	Yes
	Austria	0.07	0.07	0.07 %	0.05 %					
	Cyprus	0.002	0.002	0.01 %	0.01 %					
	Germany	0.01	0.01	< 0.001 %	< 0.001 %					
	Romania	0.04	0.05	0.01 %	0.02 %					
4 B 4	Goats					4	1	21	No	Yes
	Austria	0.01	0.01	0.01 %	0.01 %					
	Cyprus	0.002	0.001	0.01 %	0.01 %					
	Germany	0.002	0.002	< 0.001 %	< 0.001 %					
	Romania	0.004	0.01	0.001 %	0.002 %					
4 B 6	Horses					4	1	21	No	Yes
	Austria	0.11	0.11	0.11 %	0.08 %					
	Cyprus	0.001	0.001	0.004 %	0.01 %					
	Germany	0.04	0.04	0.004 %	0.003 %					
	Romania	0.11	0.10	0.02 %	0.04 %					
4 B 7	Mules and asses					1	1	24	No	Yes
	Germany	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
4 B 8	Swine					4	1	21	No	Yes
	Austria	0.81	0.82	0.80 %	0.57 %					
	Cyprus	< 0.001	< 0.001	0.002 %	0.003 %					
	Germany	0.24	0.25	0.02 %	0.02 %					
	Romania	0.26	0.25	0.06 %	0.10 %					
4 B 9 a	Laying hens					4	2	20	No	Yes
	Austria	0.13	0.13	0.13 %	0.09 %					
	Cyprus	0.003	0.003	0.01 %	0.01 %					
	Germany	0.01	0.01	0.001 %	< 0.001 %					
	Romania	0.01	0.01	0.001 %	0.002 %					
4 B 9 b	Broilers					3	3	20	No	Yes
	Cyprus	0.01	0.005	0.02 %	0.02 %					
	Germany	0.01	0.01	0.001 %	< 0.001 %					
	Romania	0.04	0.04	0.01 %	0.02 %					
4 B 9 c	Turkeys					2	3	21	No	Yes
	Cyprus	< 0.001	< 0.001	< 0.001 %	< 0.001 %					
	Germany	0.01	0.01	0.001 %	0.001 %					
4 B 9 d	Other poultry					2	1	23	No	Yes
	Austria	0.02	0.02	0.02 %	0.01 %					
	Germany	0.002	0.002	< 0.001 %	< 0.001 %					
4 B 13	Other					1	1	24	No	Yes
	Austria	0.01	0.01	0.01 %	0.01 %					
4 D 1 a	Synthetic N-fertilizers					4	1	21	No	Yes
	Austria	1.17	1.09	1.06 %	0.75 %					
	Cyprus	0.26	0.25	1.09 %	1.29 %					
	Germany	71.3	61.1	5.82 %	4.46 %					
	Spain	11.4	11.7	1.39 %	1.21 %					

Table A3.2 Status of reporting: NO_x emissions from the sector Agriculture (cont.)

NO_x Agriculture		2008 emissions	2009 emissions	% of ceiling (2009)	% of national total (2009)	No of countries that reported values	No of countries that reported 'IE'	No of countries that used other entries *	Emission factor in EMEP/ EEA GB available	Method in EMEP/ EEA GB available
4 D 2 a	Farm-level agricultural operations including storage, handling and transport of agricultural products					1	1	24	No	Yes
	Germany	69.7	71.2	6.77 %	5.20 %					
4 D 2 b	Off-farm storage, handling and transport of bulk agricultural products					0	0	26	No	Yes
4 D 2 c	N-excretion on pasture range and paddock unspecified					1	1	24	No	Yes
	Germany	10.7	10.7	1.01 %	0.78 %					
4 F	Field burning of agricultural wastes					9	1	16	T1, T2	Yes
	Austria	0.02	0.02	0.02 %	0.01 %					
	Bulgaria	3.42	3.42	1.38 %	2.08 %					
	Cyprus	0.01	0.01	0.04 %	0.05 %					
	Denmark	0.10	0.12	0.10 %	0.09 %					
	Finland	0.02	0.02	0.01 %	0.01 %					
	Greece	1.45	1.36	0.39 %	0.36 %					
	Italy	0.49	0.48	0.05 %	0.05 %					
	Portugal	1.97	1.96	0.78 %	0.82 %					
	Spain	7.14	7.14	0.84 %	0.74 %					
4 G	Agriculture other					2	0	24	No	Yes
	Austria	0.05	0.05	0.05 %	0.04 %					
	Latvia	0.01	0.02	0.04 %	0.07 %					

Note: * 'Other entries' includes zero, empty cells and notation keys NE, NA, NO.

'T1' and 'T2' refer to the availability of 'Tier 1' and Tier 2' emission factors in the EMEP/EEA Air Pollutant Emission Inventory Guidebook (EMEP/EEA, 2009)

The assessment excludes Malta for which no data submission was received.

Table A3.3 Status of reporting: NMVOC emissions from the category '2 D 2 — Food and drink'

NMVOC Food and drink		2008 emissions	2009 emissions	% of ceiling	% of national total	No of countries that reported values	No of countries that reported 'IE'	No of countries that used other entries *	Emission factor in EMEP/ EEA GB available	Method in EMEP/ EEA GB available
2 D 2	Food and drink					23	1	2	T1, T2	Yes
	Austria	2.20	2.24	1.41 %	1.84 %					
	Belgium	3.06	3.03	2.18 %	2.79 %					
	Bulgaria	2.39	2.22	1.27 %	1.64 %					
	Czech Republic	0.01	0.01	0.003 %	0.005 %					
	Denmark	8.44	8.56	10.07 %	9.10 %					
	Estonia	0.80	0.75	1.52 %	2.06 %					
	Finland	1.31	1.31	1.00 %	1.17 %					
	France	32.3	32.6	3.10 %	3.71 %					
	Germany	13.8	14.2	1.42 %	1.10 %					
	Greece	0.62	0.63	0.24 %	0.30 %					
	Hungary		6.62	4.83 %	5.75 %					
	Italy	28.5	28.3	2.44 %	2.57 %					
	Latvia	1.38	1.30	0.96 %	2.14 %					
	Lithuania	5.97	8.98	9.76 %	12.85 %					
	Netherlands	5.09	4.99	2.70 %	3.24 %					
	Poland	11.0	10.8	1.35 %	1.76 %					
	Portugal	11.7	11.7	6.53 %	6.44 %					
	Romania	4.42	4.46	0.85 %	1.03 %					
	Slovakia	0.32	0.32	0.23 %	0.50 %					
	Slovenia	0.44	0.34	0.86 %	1.05 %					
	Spain	43.4	41.4	6.25 %	6.15 %					
	Sweden	4.15	4.40	1.82 %	2.45 %					
	United Kingdom	80.5	81.3	6.78 %	9.88 %					

Note: * 'Other entries' includes zero, empty cells and notation keys NE, NA, NO.

'T1' and 'T2' refer to the availability of 'Tier 1' and Tier 2' emission factors in the EMEP/EEA Air Pollutant Emission Inventory Guidebook (EMEP/EEA, 2009)

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