

NEC Directive status report 2014

Reporting by 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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Executive summary

This report describes the most recent emission inventory information provided by the Member States of the European Union (EU) at the end of 2014, under Directive 2001/81/EC of the European Parliament and of the Council on national emission ceilings for certain atmospheric pollutants (commonly known as the National Emission Ceilings Directive (NECD)) (EU, 2001).

The NECD requires all 28 EU Member States to report information annually on emissions of four significant air pollutants: nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOCs), sulphur dioxide (SO₂) and ammonia (NH₃). These pollutants can cause respiratory problems, contribute to the acidification of soil and surface water, cause eutrophication in sensitive habitats and damage vegetation through exposure to tropospheric ozone resulting from these emissions. To help protect human health and the environment,

the NECD sets pollutant-specific and legally binding emission ceilings for each of these substances and for each country. The ceilings were to be met by 2010 as well as in future years.

Member State-reported emissions data and NECD emission ceilings

Each year, by 31 December, Member States are required to report their national emission inventories for the four NECD pollutants. More specifically, final emission data should be submitted for the previous year but one, as should provisional emission data for the previous year. Therefore, at the end of 2014, Member States were required to report final emission data for the year 2012, and provisional estimates of emissions for 2013.

Box ES.1 The European Clean Air Programme and revision of the NECD

In late 2013, following a policy review, the European Commission (EC) proposed a new European Clean Air Programme: its strategic objective is to attain air quality levels that do not give rise to significant negative impacts on, nor pose risks for, human health and the environment. The first general objective of the proposed Programme is to achieve full compliance with present air quality policies, and to conform to international commitments by 2020. Proposed policy options to help achieve this objective include the full implementation of existing measures addressing transport, small- and medium-scale combustion and background pollution (within the Member States, intra-EU and globally). Additional proposed actions include support for national and local actions through EU funds, as well as an improved research and innovation agenda within the EU Framework Programme Horizon 2020. A revised NECD would repeal and replace the current practice of annual capping of national emissions of air pollutants. The proposal ensures, however, that the national emission ceilings set in the NECD for NO_x, NMVOCs, SO₂, and NH₃ for 2010 and onwards apply until 2020.

The second general objective of the European Clean Air Programme is to reduce the impact of air pollution beyond 2020 (2030 is the target year). The proposal for a revised NECD includes new national emission reduction commitments, applicable from 2020 and 2030, for NO_x, NMVOCs, SO₂, NH₃, fine particulate matter (PM_{2.5}) and methane (CH₄). To ensure timely compliance, interim targets for the same pollutants will apply for 2025. The aim of the envisaged staggered tightening of commitments is to firstly achieve compliance with the amended Gothenburg Protocol by 2020 (UNECE, 1999, 2012a and 2012b), followed by more ambitious reductions from 2030 onward. Moreover, the package includes a proposal for a directive that would establish emission limit values for medium-sized combustion facilities (i.e. with a thermal input ranging from 1 MW to 50 MW).

For more information, see http://ec.europa.eu/environment/air/clean_air_policy.htm.

Box ES.2 Adjustments to emission inventories and commitments under the LRTAP Convention

In 2012, the Executive Body for the LRTAP Convention decided that adjustments to emission reduction commitments or to inventories may be applied, in some circumstances. The EMEP Centre on Emission Inventories and Projections (CEIP) leads the adjustment procedure and coordinates the review of any supporting documentation and assesses whether the adjustment is consistent with the particular circumstances and the guidance for adjustments.

Under the Gothenburg Protocol, inventory adjustment applications for emissions from Germany (for NO_x) and Denmark (for NH₃) were accepted by the EMEP Steering Body in 2014. For Belgium, France and Spain, the adjustment application process was not completed in 2014, and so was left pending. Following guidance of the European Commission, unadjusted emission inventory data are used in this report.

Table ES.1 summarises EU-27 ⁽¹⁾ Member State progress in meeting the NECD emission ceilings of four main air pollutants (see Table ES.1).

NO_x emissions:

- 11 Member States exceeded their ceilings in 2010 (final data);
- eight Member States exceeded their emission ceilings in 2011 (final data);
- nine Member States exceeded their ceilings in 2012 (final data);
- six Member States were still exceeding their NO_x ceilings in 2013 (Austria, Belgium, France, Germany, Ireland and Luxembourg) (provisional data).

In absolute amounts, Germany and France reported the highest exceedances of NO_x ceilings in 2013, by 218 kilotonnes and 180 kilotonnes, respectively. In percentage terms, Luxembourg (41%) and Austria (32%) continued to exceed their NO_x emission ceilings the most in 2013.

NMVOE emissions:

- four Member States exceeded their ceilings in 2010 (final data);
- five Member States exceeded their ceilings in 2011 (final data);

- four Member States exceeded their ceilings in 2012 (final data);
- three Member States were still exceeding their NMVOC ceilings in 2013 (Denmark, Germany and Ireland) (provisional data).

In absolute amounts, Germany reported the highest exceedances of NMVOC ceilings in 2013, by 143 kilotonnes. In percentage terms, Ireland (64%) and Denmark (35%) continued to exceed their NMVOC emission ceilings the most in 2013.

SO₂ emissions:

All Member States met emission ceilings for SO₂ in 2010, 2011, 2012 and 2013.

NH₃ emissions:

- six Member States (Austria, Denmark, Finland, Germany, the Netherlands and Spain) exceeded their ceilings in 2010, 2011, 2012 (final data) and 2013 (provisional data).

In absolute amounts, Germany reported the highest exceedances of NH₃ ceilings in 2013, by 121 kilotonnes. In percentage terms, Germany (22%) and Finland (20%) continued to exceed their NH₃ emission ceilings the most in 2013.

⁽¹⁾ Croatia joined the EU in July 2013, and therefore data for 2010 to 2013 are shown for informative purposes only.

Table ES.1 EU-27 Member State progress in meeting NECD emission ceilings

Member State	NO _x				NMVOCs				SO ₂				NH ₃			
	2010	2011	2012	2013	2010	2011	2012	2013	2010	2011	2012	2013	2010	2011	2012	2013
Austria	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x
Belgium	x	x	x	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓
Bulgaria	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Cyprus	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Czech Republic	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Denmark	x	✓	✓	✓	x	x	x	x	✓	✓	✓	✓	x	x	x	x
Estonia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Finland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x
France	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Germany	x	x	x	x	x	x	x	x	✓	✓	✓	✓	x	x	x	x
Greece	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Hungary	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ireland	x	x	x	x	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓
Italy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Latvia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Lithuania	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Luxembourg	x	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Malta	x	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Netherlands	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x
Poland	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Portugal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Romania	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slovakia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Slovenia	✓	x	x	✓	✓	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Spain	x	x	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	x	x	x	x
Sweden	x	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
United Kingdom	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
✓	16	19	18	21	23	22	23	24	27	27	27	27	21	21	21	21
x	11	8	9	6	4	5	4	3	0	0	0	0	6	6	6	6

Notes: '✓' indicates that the emission ceiling has been attained; 'x' indicates the ceiling has not been attained.

Years 2010, 2011 and 2012: final data; year 2013: provisional data.

Under the Gothenburg Protocol, inventory adjustment applications for emissions from Germany (for NO_x) and Denmark (for NH₃) were accepted by the EMEP Steering Body in 2014. However, emission data reported under the NECD used in this report are unadjusted.

In summary:

- final 2010 emission data show that 12 Member States exceeded one or more of the emission limits set by the NECD;
- on the basis of the final 2011 data, 11 Member States reported emission data above the ceiling for at least one pollutant;
- final 2012 data show that 12 Member States exceeded the ceilings for at least one pollutant;
- provisional 2013 data show that 10 Member States exceeded the ceilings.

Germany was the only Member State that exceeded three of the four emission ceilings under the directive in 2013 (for NO_x, NMVOCs and NH₃). Three Member States, Austria (NO_x and NH₃), Denmark (NMVOCs and NH₃) and Ireland (NO_x and NMVOCs) exceeded two ceilings in 2013.

In 2010, 2011, 2012 (final data) and 2013 (provisional data), the aggregated EU-27 NO_x emissions did not exceed the NECD Annex I ceiling (see Table 2.1). However, the NECD Annex II ceiling, addressing environmental objectives, was still exceeded in 2010, 2011 and 2012, though the level of exceedance decreased over the three years. The provisional data suggest that emissions were just below the ceiling in 2013. The aggregated EU-27 ceiling for NH₃ were not exceeded in 2010, 2011, 2012 and 2013, but emissions did not decrease considerably over the four years (Table 2.1). The NECD does not include a NH₃ ceiling addressing environmental objectives (EU, 2001).

The road transport sector is one of the main contributing factors for the large number of NO_x exceedances, particularly as reductions of NO_x emissions from this sector over the last two decades have not been as large as originally anticipated. This is partly because the sector has grown more than expected, and partly owing to the increased penetration of diesel vehicles producing higher NO_x emissions than petrol-fuelled vehicles (EEA, 2011). Actual emissions from vehicles driven on roads under normal conditions are also higher than originally expected, with 'real-world emissions' often largely exceeding the permitted test-cycle emissions used for certification of vehicles complying with Euro standards. This is particularly true for light-duty diesel vehicles.

Member States regularly update the emission factors used in their inventories, and reported developments in emissions have to be based on 'real-world' emission factors.

Agriculture dominates emissions of NH₃, amounting to almost 95% of the total emissions in the EU-27. Emissions primarily arise from the decomposition of urea in animal wastes, uric acid in poultry wastes and from the spreading of fertiliser. Emissions depend on the animal species, age, weight, diet, housing systems, waste management and liquid manure storage techniques. Compared with the other pollutants addressed in the NECD, emissions from agriculture have not decreased to the same extent since 1990.

Compared to the previous reporting cycle, when only provisional 2012 data were available ⁽²⁾, several Member States reported revised final 2012 emissions data, thereby changing the emission ceilings attainment status of seven Member States. It is noted that these changes are all related to NMVOCs or NH₃:

- Belgium, Denmark, Germany and Ireland reported provisional 2012 NMVOC data below their emission ceilings. Due to emission recalculations, the attainment status of these countries changed, and their NMVOC emissions of the year 2012 now exceed their ceilings. The changes are primary due to additional reporting in the agriculture sector (see also NH₃ below).
- Provisional 2012 emission data indicated that Luxembourg did not attain its NMVOC emission ceiling. However, final 2012 emission data now indicate that Luxembourg's NMVOC emissions are below the ceiling. This is mainly attributable to recalculations in the emission inventory source categories 2D3a (Domestic solvent use including fungicides) and categories 2D3d to 2D3i (Coating applications, Degreasing, Dry cleaning, Chemical products, Printing and Other solvent use). Austria reported provisional 2012 NH₃ data below its emission ceiling. The final 2012 NH₃ emissions however now exceed the ceiling — likewise for the years 2010, 2011 and 2013. The changes are primarily due to recalculations in the agriculture sector. Based on a new study, the Austrian inventory model for the agriculture sector was revised. The Austrian sectorial inventory model follows the nitrogen (N-flow) concept. Due to the applied N balance model, which considers reactions

(2) Provisional 2012 data in this report refer to data for 2012 reported in the prior (2013) reporting round, which were documented in the previous annual NEC Directive status report 2013 (EEA, 2014a).

throughout the N-flow in agricultural systems, the recalculations resulted in higher NH₃ emissions and lower N₂O emissions.

- Germany and the Netherlands reported increases of NH₃ emissions with regard to the provisional and final 2012 data. This changes their attainment status. The changes are primarily due to recalculations in the agriculture sector. For both countries, the NH₃ emission levels from agriculture increased due to improved emission factors for the different husbandry systems and manure application (EMEP/EEA, 2013). In Germany the new NH₃ emission factors nearly doubled the fertiliser-induced NH₃ emissions. Furthermore new sources were added to the inventories (e.g. application of sewage sludge, compost and emissions from crop residues), and livestock data were updated (e.g. for dairy cows and other cattle).

EU progress in meeting its emission ceilings

The EU itself has two different sets of emission ceilings for 2010 and onwards, as set out in the NECD ⁽³⁾.

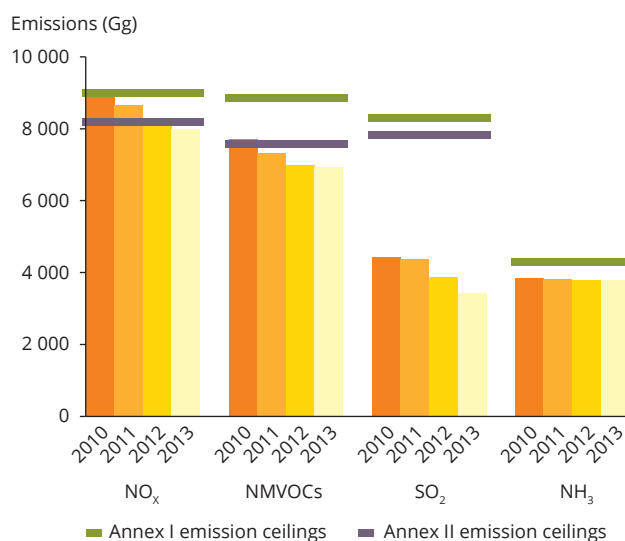
Based on the aggregated reported final 2010, final 2011, final 2012 data and provisional 2013 emission data (see Figure ES.1), the less stringent ceilings of Annex I to the NECD have not been exceeded.

For NO_x, the aggregated EU-27 emissions data are however above the respective Annex II ceiling for the years 2010, 2011 and 2012. In 2013, provisional emission data are slightly below the ceilings (see Figure ES.1). For NMVOCs, emission data of the year 2010 are above the ceiling, but for the years 2011, 2012 and 2013, the Annex II emission ceiling is not exceeded. SO₂ emission data of all years are below the levels of emissions ceilings.

Past emission trends

Under the NECD, Member States are formally obliged to submit only two years of emission data. This hampers any reliable assessment of long-term emission trends (either within individual Member States or for the EU as a whole). Nevertheless, several Member States voluntarily submit updated emission data under NECD reporting for all years as far back

Figure ES.1 EU-27 progress in meeting emission ceilings set out in NECD Annexes I and II: aggregated Member State final 2010, final 2011, final 2012 and provisional 2013 emission data, compared with EU-27 emission ceilings



Note: The emission ceilings shown are those set out for the EU in Annexes I and II to the NECD. The aggregated emission estimates comprise unadjusted emission data reported on the basis of fuel used (6 Member States) and fuel sold (21 Member States) for mobile sources. An overview of the basis used by Member States for estimating emissions from mobile sources is given in Table 2.4.

as 1990. These EU Member States declare considerable emission reductions of the four NECD pollutants since 1990. A more complete picture of past emission trends in the EU will be provided in mid-2015 when the EEA will publish the annual EU emission report under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP Convention) (EEA, 2015a).

Completeness of data reporting

a) Pollutant-source combinations not included in the original 2010 emission ceilings

Since the original 2010 emissions ceilings were set, improved knowledge has become available on the sources of air pollutants. In several instances, 'new' emission source categories for the pollutants covered

⁽³⁾ Annexes I and II to the NECD define emission ceilings for the EU. The Annex I EU ceilings represent the aggregation of individual Member State ceilings defined in that annex. The Annex II EU ceilings are stricter than those of Annex I and are designed with the aim of attaining, by 2010, for the EU 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). Annex II of the NECD does not define a separate ceiling for NH₃.

within the scope of the NECD have been identified; in some cases, based on measurements, emission factors have been developed (e.g. for NO_x and NMVOC emissions in the agriculture sector) that allow emission estimates to be made.

As in 2014, this report focuses on NO_x and NMVOC emissions from the agriculture sector as examples of source categories which were not considered when the targets were set, but for which emission inventory guidance is now available (EMEP/EEA, 2013). The aim is to assess the magnitude of these emissions as compared with National Totals, and attainment with national emission ceilings. At EU-27 level, NO_x and NMVOC emissions from the agriculture sector amount to 2.4% and 8.5% of total emissions in 2013, respectively.

Based on NO_x emission estimates for 2013 as provided by 21 Member States, NO_x from agriculture contributes to maximal 11% to the respective National Totals. The exclusion from the National Total of NO_x emitted by the agriculture sector would not by itself change the attainment status of any Member State.

However, NMVOC emissions from agriculture for 2013 (as provided by 23 Member States) have a higher contribution, up to 47% of the National Total emissions. The exclusion from NMVOCs emitted by the agriculture sector from the National Total would change the attainment status of three Member States (Denmark, Germany and Ireland), i.e. these countries would not meet their ceilings. In the year 2010, excluding NMVOC data from the agriculture sector would have brought the EU emissions below the EU Annex II ceiling. The same is true for NO_x emissions in the year 2012.

A second analysis was performed to assess the number of Member States that report NH₃ emissions from the 'new' sources '3Da4 — Crop residues applied to soil' and '3De — Cultivated crops'. Data from these categories were reported by only three Member States for the year 2013. The share of National Total NH₃ emissions was highest for Denmark (7%); here excluding NH₃ emissions of these categories from the National Total would change the attainment status of Denmark and Austria, i.e. the NH₃ ceiling would be achieved if this category was excluded from the National Totals.

The two examples mentioned above show that incomplete reporting coupled with the apparent significant contribution of such sources to National Totals causes emissions to be underestimated in a number of Member States, in some cases significantly so.

b) 'Not estimated' emissions

The reporting guidelines of the LRTAP Convention (UNECE, 2014a) (and through Annex III of the NECD, by extension applicable also to reporting under this EU directive) allow Member States to report emissions as 'not estimated' (NE) for sectors where emissions are known to occur but have not been calculated or reported. Ideally 'NE' should only be used for sources that are very small, where, for example, it may be less cost-effective to develop a specific estimation methodology than to improve the accuracy of estimates for more significant sources.

By definition, use of the 'NE' notation key means national inventories are incomplete; emission totals are therefore underestimated. Seventeen Member States used the notation key 'NE' for more than 10 source categories. Only nine Member States provided reasons for using it in their data submissions under the NECD, and it should be noted that Member States provided more information under their LRTAP Convention submissions (the reporting deadline was 15 February). However, the information provided varied somewhat in terms of informative value.

Transparency of reported information

Providing inventory reports or additional explanatory information that describes the methods and sources of the reported data is not mandatory under the NECD; this limits the transparency of the data submission. Nevertheless, 11 Member States (Austria, Croatia, Estonia, Finland, Germany, Latvia, the Netherlands, Poland, Romania, Slovakia and Sweden) voluntarily submitted inventory reports alongside their NECD inventories.

Public access to data and reports

Data described in this report are available from the EEA online data viewer (EEA, 2015b).

The EEA also publishes individual air pollution fact sheets (e.g. EEA, 2014b) for each Member State, providing additional analyses of various parameters; these include current progress made in achieving the respective emission ceilings for each pollutant. Updated fact sheets will be published by the EEA in the autumn of 2015.

Units and abbreviations

CDR	(Eionet) Central Data Repository
CEIP	(EMEP) Centre on Emission Inventories and Projections
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
EC	European Commission
Gg	1 gigagram = 10^9 g = 1 kiloton (kt)
GHG inventory	Greenhouse gas inventory
IIR	Informative Inventory Report
LRTAP Convention	UNECE Convention on Long-range Transboundary Air Pollution
MW	megawatt
NE	'not estimated' (notation key)
NECD	National Emission Ceilings Directive
NFR	nomenclature for reporting (UNECE)
NH ₃	ammonia
NMVOCs	non-methane volatile organic compounds
N ₂ O	nitrous oxide
NO _x	nitrogen oxides
PM	particulate matter
PM _{2.5}	fine particulate matter, i.e. with a diameter of 2.5 micrometres or less
SO ₂	sulphur dioxide
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
UNFCCC/MMR	EU Monitoring Mechanism/UNFCCC

1 Introduction

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

Directive 2001/81/EC of the European Parliament and of the Council on national emission ceilings for certain atmospheric pollutants (known as the National Emission Ceilings Directive (NECD)) (EU, 2001) highlights the importance of reporting air pollutant emission data for assessing progress in reducing air pollution in the European Union (EU) and for ascertaining whether Member States are in compliance with their commitments ⁽⁴⁾.

This report provides an overview of the latest emission data submitted by Member States under the NECD. It also presents a comparison of the emission ceilings of nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOCs) ⁽⁵⁾, sulphur dioxide (SO₂), and ammonia (NH₃) emissions and the reported emission data for 2012 (final data) and 2013 (provisional data). Additionally, final 2010 and 2011 emission data are discussed within this report. In instances where Member States did not resubmit new 2010 and 2011 data, emission data for these years submitted in 2012 and 2013 were used (EEA, 2013 and 2014a).

1.1 Reporting requirements under the NECD

Articles 2, 6, 7 and 8 of the NECD set out the requirements for EU Member States on national inventories, projections and programmes. According to these provisions, Member States are to prepare and annually update national total emissions estimates for the pollutants NO_x, NMVOCs, SO₂, and NH₃. In previous years, Member States were also required to report projected emissions for the year 2010 for

all four pollutants (this is no longer required). The requirement to report future projections is included in the European Commission's proposal for a revised NECD (see Box ES.1). In addition, by 31 December each year, Member States should report to the European Commission and the EEA these national emission inventories; final emission data should be submitted for the previous year but one, as should provisional emission data for the previous year.

Member States were also obliged to report their updated national programmes for progressive reduction of national emissions of NO_x, NMVOCs, SO₂, and NH₃ to the European Commission by the end of 2006.

To help ensure that information on emissions reported by Member States is consistent and harmonised, the NECD (Annex III) requires Member States to prepare emission inventories using the methodologies agreed upon by the LRTAP Convention. It also requests that Member States use the *EMEP/Corinair emission inventory guidebook* (since renamed the *EMEP/EEA air pollutant emission inventory guidebook* (EMEP/EEA, 2013)), in preparing their inventories and projections.

Moreover, it is considered good practice for Member States to adhere to the principles outlined in the UNECE guidelines for reporting emission data under the LRTAP Convention (UNECE, 2014a). The historic emission data presented must be 'transparent, consistent, comparable, complete and accurate'.

Further, the guidelines specify how emissions from transport should be estimated and reported. Austria, Belgium, Ireland, Lithuania, Luxembourg, the Netherlands and the United Kingdom may thus additionally choose to use the national emission total calculated based on fuels used in the geographic area of the party as a basis for compliance, whereas all other EU Member States use fuel sold as a basis.

⁽⁴⁾ Croatia joined the EU in July 2013, and therefore data for 2010 to 2013 are shown for informative purposes only.

⁽⁵⁾ The NECD defines VOCs as being non-methane volatile organic compounds (NMVOCs), i.e. methane (CH₄) is not considered.

1.1.1 Scope

The NECD covers emissions from all relevant sources of NO_x, NMVOCs, SO₂, and NH₃ which arise as a result of human activities within the territory of the Member States and their exclusive economic zones, except:

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

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

As specified in Article 7 of the NECD, the European Commission — assisted by the EEA — must prepare inventories (and projections) for relevant pollutants, in cooperation with Member States and based on information that the Member States provide. A description of the quality assurance/quality control activities related to the compilation of the EU inventory, together with a description of the institutional arrangements and the data flow underpinning this report, are available in the NEC Directive status report 2011 (see Chapter 1.2.2 Inventory QA/QC activities, EEA, 2012).

The NECD also requires that inventories and projections be made publicly available. Data described in this report can be accessed both online from an EEA data viewer ⁽⁶⁾ (EEA, 2015b) and also separately as downloadable files from the EEA dataservice.

1.1.3 Inventory adjustment applications under the Gothenburg Protocol

In 2012, the Executive Body for the LRTAP Convention decided that adjustments to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them, may be applied in some circumstances, in the event that such a circumstance contributes to a party being unable

to meet one of its reduction commitments (UNECE, 2012c). In 2012, the Executive Body for the LRTAP Convention decided that adjustments to emission reduction commitments or to inventories may be applied, in some circumstances. The EMEP Centre on Emission Inventories and Projections (CEIP) leads the adjustment procedure, coordinates the review of any supporting documentation and assesses whether the adjustment is consistent with the particular circumstances and the guidance for adjustments (UNECE, 2012d).

In 2014, inventory adjustment applications for emissions from Germany (for NO_x) and Denmark (for NH₃), were accepted by the EMEP Steering Body (UNECE, 2014b). Adjusted emissions of the year 2012 amount to 1 072 Gg (NO_x for Germany) and 68 Gg (NH₃ for Denmark), i.e. adjustments would bring Denmark below the NH₃ NECD Annex I ceilings. For Belgium, France and Spain, the adjustment review process was not completed in 2014, and the applications were subsequently left pending (UNECE, 2014b). Emission data used within this report are unadjusted for all Member States. Adjusted data for 2013 are not available yet. Following guidance of the European Commission, unadjusted emission inventory data are used in this report.

1.1.4 Differences between NECD, LRTAP Convention and UNFCCC/MMR inventory reporting

In addition to reporting emission data under the NECD, Member States that are also Parties to international conventions are also required to report emissions of certain pollutants. The respective international reporting obligations are: the protocols of the LRTAP Convention (UNECE, 1979), and the EU Monitoring Mechanism (EU, 2013) and its implementing provisions. Table 1.1 provides an overview of Member States' air pollution reporting obligations. The EU as a whole is also a Party to the LRTAP Convention.

The three reporting obligations listed in Table 1.1 differ mainly in the number and type of air pollutants for which reporting is required, the geographical coverage of countries (e.g. whether overseas dependencies are included in the territories of Denmark, France, Portugal, Spain or the United Kingdom), and whether domestic and international aviation and navigation are included in the National Total.

⁽⁶⁾ <http://www.eea.europa.eu/data-and-maps/data/data-viewers/emissions-nec-directive-viewer>.

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

Legal obligation	Emission reporting requirements	Annual reporting deadline for EU Member States	Annual reporting deadline for the EU
NECD	Emissions of NO _x , NMVOCs, SO ₂ and NH ₃	31 December	n/a
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 (UNFCCC/MMR)	Emissions of CO ₂ , CH ₄ , N ₂ O, HFCs, PFCs, SF ₆ , NF ₃ , NO _x , CO, NMVOCs and SO ₂	15 January (to the European Commission) 15 April (to the UNFCCC)	15 April

Notes: ^(a) Parties are formally required to report only on the substances and for the years set forth in protocols that have entered into force and that have been ratified by the party.

CH₄: methane; CO: carbon monoxide; CO₂: carbon dioxide; HFCs: hydrofluorocarbons; HMs: heavy metals; NF₃: nitrogen trifluoride; N₂O: nitrous oxide; NO₂: nitrogen dioxide; PFCs: perfluorocarbons; PM: particulate matter; POPs: persistent organic pollutants; SF₆: sulphur hexafluoride; SO_x: sulphur oxides; SO₂: sulphur dioxide.

Table 1.2 Major differences between reporting obligations: LRTAP Convention, NECD and UNFCCC/MMR

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

Notes: NECD: NO_x, NMVOCs, SO₂ and NH₃.

LRTAP: NO_x, NMVOCs, SO_x, NH₃, CO, HMs, POPs and PM.

UNFCCC/MMR: CO₂, CH₄, N₂O, HFCs, PFCs, SF₆, NO_x, NMVOCs, SO₂ and CO.

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

^(b) Austria, Belgium, Ireland, Lithuania, Luxembourg, the Netherlands, Switzerland and the United Kingdom may additionally choose to use the national emission total calculated on the basis of fuel used in the geographic area of the party as a basis for compliance (UNECE, 2014a).

2 Assessment of EU and Member State emissions

This chapter compares emissions and ceilings, and presents the development of NO_x, NMVOCs, SO₂ and NH₃ emissions as reported by the Member States under the NECD, over the last 4 years. Appendices 1 and 2 provide an overview of the data available up to and including 1 February 2015 from the current NECD reporting round used in this report. Data provided in previous reporting cycles are not considered, except in instances where Member States did not resubmit new 2010 and 2011 data, in which case the emission data submitted in 2012 and 2013 were used (EEA, 2013 and 2014a).

2.1 EU progress in meeting emission ceilings

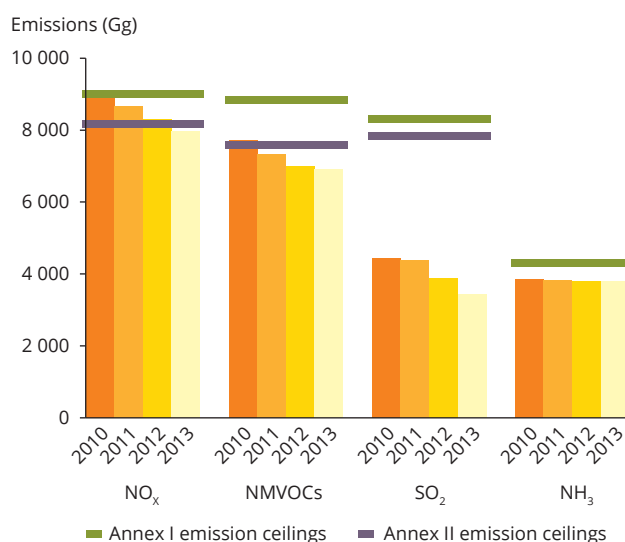
Figure 2.1 illustrates the EU-27's progress in meeting its emission ceilings, as specified in Annexes I and II to the NECD. For all pollutants, the final 2010, final 2011, final 2012 and provisional 2013 emission data are lower than the respective aggregated 2010 ceiling (Annex I to the NECD). However, emission data for NH₃ did not change much over the last four years.

Of the three stricter Annex II emission ceilings designed with the aim of achieving the NECD's interim environmental objectives by 2010, NO_x emission data are above the ceiling for the final 2010, final 2011 and final 2012 data. Further, NMVOC data are above the ceiling for the final 2010 data (see Figure 2.1 and Table 2.1).

Provisional 2013 data reveal no exceedance of the Annex I or II ceilings for any of the four pollutants. However, some uncertainty exists concerning the 2013 data, since final 2013 emission data will only be reported at the end of 2015.

Evaluation of previous submissions shows that the range of recalculations (provisional to final) is expected to be in the range of a few percent. For

Figure 2.1 EU-27 progress in meeting emission ceilings set out in NECD Annexes I and II: aggregated Member State final 2010, final 2011, final 2012 and provisional 2013 emission data, compared with EU-27 emission ceilings



Notes: The emission ceilings shown are those set out for the EU in Annexes I and II to the NECD (?).

The aggregated emission estimates are a mix of unadjusted emission data reported on the basis of fuel used (6 Member States) and fuel sold (21 Member States) for mobile sources. An overview of the basis on which emissions from mobile sources was estimated is given in Table 2.4.

instance, a comparison of provisional 2012 emission data (submitted in 2013) and final 2012 emission data (submitted in 2014) for the EU-27 (see Table 2.3) showed that NO_x and SO₂ emissions were slightly lower in the final estimate (– 0.7% and – 2.8%, respectively). In contrast, for NMVOCs and NH₃, such recalculations in the national emission inventories led to an increase at EU-27 level (+ 4.1% and + 5.0%, respectively).

(?) Annexes I and II to the NECD define emission ceilings for the EU (EC, 2001). The Annex I EU ceilings represent the aggregation of individual Member State ceilings defined in that annex. The Annex II EU ceilings are stricter than those of Annex I, and are designed with the aim of attaining, by 2010, for the EU as a whole, the interim environmental objectives set out in Article 5 of the NECD (i.e. a reduction of European ecosystem areas where the critical loads for acidification are exceeded, as well as of vegetation-related ground-level ozone exposure by 2010, compared with the 1990 situation). There is no separate ceiling for NH₃ defined in Annex II to the NECD.

Table 2.1 Comparison of aggregated EU-27 final 2010, 2011, 2012 and provisional 2013 emission data with emission ceilings

NECD Annex I emission ceilings					NECD Annex II emission ceilings				
	NO _x	NMVOCs	SO ₂	NH ₃		NO _x	NMVOCs	SO ₂	NH ₃
Ceilings (Gg)	9 003	8 848	8 297	4 294	Ceilings (Gg)	8 180	7 585	7 832	No ceiling
Final 2010 emission data (Gg)	8 978	7 719	4 430	3 836	Final 2010 emission data (Gg)	8 978	7 719	4 430	3 836
Difference from emissions (%)	- 0.3%	- 12.8%	- 46.6%	- 10.7%	Difference from emissions (%)	9.8%	1.8%	- 43.0%	---
Final 2011 emission data (Gg)	8 649	7 322	4 381	3 822	Final 2011 emission data	8 649	7 322	4 381	3 822
Difference from emissions (%)	- 3.9%	- 17.3%	- 47.2%	- 11.0%	Difference from emissions (%)	5.7%	- 3.5%	- 44.1%	---
Final 2012 emission data (Gg)	8 302	7 003	3 872	3 793	Final 2012 emission data	8 302	7 003	3 872	3 793
Difference from emissions (%)	- 7.8%	- 20.9%	- 53.3%	- 11.7%	Difference from emissions (%)	1.5%	- 7.7%	- 50.6%	---
Provisional 2013 emission data (Gg)	7 976	6 922	3 431	3 795	Provisional 2013 emission data	7 976	6 922	3 431	3 795
Difference from emissions (%)	- 11.4%	- 21.8%	- 58.7%	- 11.6%	Difference from emissions (%)	- 2.5%	- 8.7%	- 56.20%	---

Note: The emission ceilings shown are the EU-27 emission ceilings set out in Annexes I and II to the NECD. Annex II to the NECD, addressing environmental objectives, does not define a ceiling for NH₃.

2.2 Comparison of Member State-reported emissions data with NECD emission ceilings

Table 2.2 provides an overview of Member State final 2010, final 2011 and final 2012 data and provisional 2013 emission data submitted under the NECD, as compared to the emission ceilings.

Final 2010 emission data show that 12 Member States exceeded one or more of the emission limits set by the NECD. On the basis of the final 2011 data, 11 Member States reported emission data above the ceiling for at least one pollutant. Final 2012 data show again 12 Member States and provisional 2013 data show 10 Member States exceeding the ceilings (Table 2.3).

In comparing provisional 2012 data reported in 2013 with final 2012 data reported in 2014, recalculations changed the status (i.e. compliance with the Annex I ceilings of the NECD) of seven Member States: Austria (NH₃), Belgium (NMVOCs), Denmark (NMVOCs), Germany (NMVOCs and NH₃), Ireland (NMVOCs), Luxembourg (NMVOCs) and the Netherlands (NH₃) (see Section 2.3 for further details). These changes are all related to NMVOCs or NH₃.

Some Member States reported very large differences (over 25%) between the provisional 2012 and final 2012 data: Ireland had the highest change (+ 104.9% for NMVOCs), followed by Latvia (+ 64.4% for NMVOCs), Denmark (+ 50.0% for NMVOCs), Lithuania (- 45.0% for SO₂), Greece (- 33.1% for SO₂), Belgium (+ 32.7% for NMVOCs), Luxembourg (- 30.7% for NMVOCs), Hungary (+ 29.0 for NH₃), and Luxembourg (- 26.6% for SO₂) (see Section 2.3 for further details).

Table 2.2 Overview of Member State final 2010, final 2011, final 2012 emission data and provisional 2013 emission data submitted under NECD and emission ceilings for 2010

Member State	NO _x									NMVOCs								
	NO _x final emission data (Gg)			NO _x provisional emission data	NO _x ceilings (Annex I)	Emissions ceiling comparison				NMVOCs final emission data (Gg)			NMVOCs provisional emission data	NMVOC ceilings (Annex I)	Emissions ceiling comparison			
	2010	2011	2012			2013	2010	2011	2012	2013	2010	2011			2012	2013	2010	2011
Austria	148	145	141	136	103	x	x	x	x	129	125	132	125	159	✓	✓	✓	✓
Belgium	229	214	204	197	176	x	x	x	x	155	143	141	138	139	x	x	x	✓
Bulgaria	117	136	123	112	247	✓	✓	✓	✓	93	91	82	80	175	✓	✓	✓	✓
Cyprus	19	21	21	16	23	✓	✓	✓	✓	10	8	8	7	14	✓	✓	✓	✓
Czech Republic	239	225	193	179	286	✓	✓	✓	✓	151	136	146	134	220	✓	✓	✓	✓
Denmark	132	124	115	110	127	x	✓	✓	✓	125	119	116	114	85	x	x	x	x
Estonia	37	36	32	30	60	✓	✓	✓	✓	35	33	34	33	49	✓	✓	✓	✓
Finland	167	154	147	145	170	✓	✓	✓	✓	116	106	105	95	130	✓	✓	✓	✓
France	1 096	1 036	1 008	990	810	x	x	x	x	874	807	772	758	1 050	✓	✓	✓	✓
Germany	1 334	1 311	1 270	1 269	1 051	x	x	x	x	1 239	1 169	1 136	1 138	995	x	x	x	x
Greece	319	296	248	239	344	✓	✓	✓	✓	185	159	156	145	261	✓	✓	✓	✓
Hungary	156	143	127	123	198	✓	✓	✓	✓	129	123	122	124	137	✓	✓	✓	✓
Ireland	82	73	76	77	65	x	x	x	x	91	89	88	90	55	x	x	x	x
Italy	964	930	849	837	990	✓	✓	✓	✓	1 080	989	836	878	1 159	✓	✓	✓	✓
Latvia	38	33	34	34	61	✓	✓	✓	✓	89	88	89	87	136	✓	✓	✓	✓
Lithuania	50	46	48	49	110	✓	✓	✓	✓	71	69	70	65	92	✓	✓	✓	✓
Luxembourg	18	19	18	15	11	x	x	x	x	7	7	7	7	9	✓	✓	✓	✓
Malta	8	8	9	5	8	x	✓	x	✓	3	3	3	3	12	✓	✓	✓	✓
Netherlands	274	258	248	240	260	x	✓	✓	✓	158	156	154	150	185	✓	✓	✓	✓
Poland	861	842	819	796	879	✓	✓	✓	✓	653	638	630	636	800	✓	✓	✓	✓
Portugal	181	173	167	166	250	✓	✓	✓	✓	179	173	167	168	180	✓	✓	✓	✓
Romania	218	223	226	194	437	✓	✓	✓	✓	365	356	354	334	523	✓	✓	✓	✓
Slovakia	89	85	81	80	130	✓	✓	✓	✓	64	70	61	63	140	✓	✓	✓	✓
Slovenia	45	46	46	43	45	✓	x	x	✓	35	41	35	34	40	✓	x	✓	✓
Spain	886	881	850	750	847	x	x	x	✓	634	603	556	538	662	✓	✓	✓	✓
Sweden	150	139	131	126	148	x	✓	✓	✓	192	187	179	174	241	✓	✓	✓	✓
United Kingdom	1 123	1 051	1 073	1 020	1 167	✓	✓	✓	✓	855	835	824	803	1 200	✓	✓	✓	✓
EU-27	8 978	8 649	8 302	7 976	9 003	✓	✓	✓	✓	7 719	7 322	7 003	6 922	8 848	✓	✓	✓	✓
Croatia (*)	64	60	56	56	87					55	53	49	46	90				

Table 2.2 Overview of Member State final 2010, final 2011, final 2012 emission data and provisional 2013 emission data submitted under NECD and emission ceilings for 2010 (cont.)

Member State	SO ₂								NH ₃								Emission estimates from mobile sources based on		
	SO ₂ final emission data (Gg)			SO ₂ provisional emission data	SO ₂ ceilings (Annex I)	Emissions ceiling comparison				NH ₃ final emission data (Gg)			NH ₃ provisional emission data	NH ₃ ceilings (Annex I)	Emissions ceiling comparison				
	2010	2011	2012			2010	2011	2012	2013	2010	2011	2012			2010	2011		2012	2013
Austria	19	18	17	17	39	✓	✓	✓	✓	67	67	67	66	66	*	*	*	*	Fuel used
Belgium	61	53	47	46	99	✓	✓	✓	✓	69	68	67	66	74	✓	✓	✓	✓	Fuel used
Bulgaria	387	515	329	194	836	✓	✓	✓	✓	51	39	38	38	108	✓	✓	✓	✓	Fuel sold
Cyprus	22	21	16	14	39	✓	✓	✓	✓	6	5	5	5	9	✓	✓	✓	✓	Fuel sold
Czech Republic	170	165	155	139	265	✓	✓	✓	✓	69	66	67	69	80	✓	✓	✓	✓	Fuel sold
Denmark	15	15	13	14	55	✓	✓	✓	✓	80	79	77	74	69	*	*	*	*	Fuel sold
Estonia	83	73	41	36	100	✓	✓	✓	✓	10	10	11	11	29	✓	✓	✓	✓	Fuel sold
Finland	67	61	51	47	110	✓	✓	✓	✓	38	37	37	37	31	*	*	*	*	Fuel sold
France	285	249	235	219	375	✓	✓	✓	✓	729	721	722	718	780	✓	✓	✓	✓	Fuel sold
Germany	434	431	417	416	520	✓	✓	✓	✓	643	675	655	671	550	*	*	*	*	Fuel sold
Greece	265	262	164	152	523	✓	✓	✓	✓	64	62	61	61	73	✓	✓	✓	✓	Fuel sold
Hungary	32	35	32	30	500	✓	✓	✓	✓	76	77	76	80	90	✓	✓	✓	✓	Fuel sold
Ireland	28	27	25	25	42	✓	✓	✓	✓	109	105	106	108	116	✓	✓	✓	✓	Fuel used
Italy	210	195	178	168	475	✓	✓	✓	✓	379	382	404	390	419	✓	✓	✓	✓	Fuel sold
Latvia	3	2	2	2	101	✓	✓	✓	✓	14	14	15	15	44	✓	✓	✓	✓	Fuel sold
Lithuania	21	23	20	19	145	✓	✓	✓	✓	43	42	42	40	84	✓	✓	✓	✓	Fuel sold
Luxembourg	2	1	1	2	4	✓	✓	✓	✓	5	4	4	4	7	✓	✓	✓	✓	Fuel used
Malta	8	8	8	5	9	✓	✓	✓	✓	2	1	2	2	3	✓	✓	✓	✓	Fuel sold
Netherlands	34	34	34	30	50	✓	✓	✓	✓	144	140	136	134	128	*	*	*	*	Fuel used
Poland	937	885	859	847	1 397	✓	✓	✓	✓	271	271	263	263	468	✓	✓	✓	✓	Fuel sold
Portugal	53	48	43	42	160	✓	✓	✓	✓	47	47	48	48	90	✓	✓	✓	✓	Fuel sold
Romania	350	322	260	205	918	✓	✓	✓	✓	160	159	158	157	210	✓	✓	✓	✓	Fuel sold
Slovakia	69	68	58	53	110	✓	✓	✓	✓	25	24	25	25	39	✓	✓	✓	✓	Fuel sold
Slovenia	10	11	10	11	27	✓	✓	✓	✓	17	18	18	18	20	✓	✓	✓	✓	Fuel sold
Spain	404	440	388	278	746	✓	✓	✓	✓	388	378	364	371	353	*	*	*	*	Fuel sold
Sweden	32	29	28	27	67	✓	✓	✓	✓	52	52	51	52	57	✓	✓	✓	✓	Fuel sold
United Kingdom	428	391	440	393	585	✓	✓	✓	✓	279	279	275	271	297	✓	✓	✓	✓	Fuel used
EU-27	4 430	4 381	3 872	3 431	8 297	✓	✓	✓	✓	3 836	3 822	3 793	3 795	4 294	✓	✓	✓	✓	
Croatia ^(*)	35	29	25	16	70					39	39	39	34	30					Fuel sold

Notes: ^(*) Croatia joined the EU in July 2013, and therefore data for 2010 to 2013 are shown for informative purposes only.

'✓' indicates that emission data reported by a Member State meet or lie below the respective emission ceiling.

'*' indicates that a ceiling has not been attained.

Table 2.3 Comparison of provisional 2012 emission data (submitted in 2013) and final 2012 emission data (submitted in the latest 2014 reporting round)

Member State	NO _x			NMVOCs			SO ₂			NH ₃		
	Are 2012 provisional data below the ceiling?	Are 2012 final data below the ceiling?	Change between provisional and final data (in%)	Are 2012 provisional data below the ceiling?	Are 2012 final data below the ceiling?	Change between provisional and final data (in%)	Are 2012 provisional data below the ceiling?	Are 2012 final data below the ceiling?	Change between provisional and final data (in%)	Are 2012 provisional data below the ceiling?	Are 2012 final data below the ceiling?	Change between provisional and final data (in%)
Austria	No	No	0.0%	Yes	Yes	- 0.9%	Yes	Yes	0.5%	Yes	No	7.3%
Belgium	No	No	- 0.8%	Yes	No	32.7%	Yes	Yes	- 4.7%	Yes	Yes	- 1.4%
Bulgaria	Yes	Yes	- 0.6%	Yes	Yes	- 10.3%	Yes	Yes	- 0.1%	Yes	Yes	- 1.6%
Cyprus	Yes	Yes	1.5%	Yes	Yes	- 16.1%	Yes	Yes	- 0.2%	Yes	Yes	1.8%
Czech Republic	Yes	Yes	- 8.4%	Yes	Yes	10.5%	Yes	Yes	- 2.2%	Yes	Yes	5.2%
Denmark	Yes	Yes	- 0.7%	Yes	No	50.0%	Yes	Yes	2.8%	No	No	8.9%
Estonia	Yes	Yes	0.0%	Yes	Yes	0.2%	Yes	Yes	0.0%	Yes	Yes	- 0.8%
Finland	Yes	Yes	0.0%	Yes	Yes	0.0%	Yes	Yes	0.0%	No	No	1.8%
France	No	No	2.5%	Yes	Yes	8.6%	Yes	Yes	1.5%	Yes	Yes	6.3%
Germany	No	No	- 0.3%	Yes	No	19.1%	Yes	Yes	- 2.4%	Yes	No	20.1%
Greece	Yes	Yes	- 4.0%	Yes	Yes	2.6%	Yes	Yes	- 33.1%	Yes	Yes	0.0%
Hungary	Yes	Yes	8.2%	Yes	Yes	22.6%	Yes	Yes	0.2%	Yes	Yes	29.0%
Ireland	No	No	6.5%	Yes	No	104.9%	Yes	Yes	8.6%	Yes	Yes	1.3%
Italy	Yes	Yes	- 6.6%	Yes	Yes	- 12.3%	Yes	Yes	- 2.9%	Yes	Yes	- 0.2%
Latvia	Yes	Yes	- 3.0%	Yes	Yes	64.4%	Yes	Yes	- 17.2%	Yes	Yes	- 21.3%
Lithuania	Yes	Yes	- 17.4%	Yes	Yes	17.5%	Yes	Yes	- 45.0%	Yes	Yes	9.3%
Luxembourg	No	No	5.6%	No	Yes	- 30.7%	Yes	Yes	- 26.6%	Yes	Yes	- 3.6%
Malta	No	No	0.0%	Yes	Yes	0.0%	Yes	Yes	0.0%	Yes	Yes	0.0%
Netherlands	Yes	Yes	- 0.2%	Yes	Yes	5.5%	Yes	Yes	0.4%	Yes	No	12.8%
Poland	Yes	Yes	0.2%	Yes	Yes	0.0%	Yes	Yes	0.6%	Yes	Yes	0.0%
Portugal	Yes	Yes	- 1.3%	Yes	Yes	- 0.6%	Yes	Yes	- 22.9%	Yes	Yes	0.6%
Romania	Yes	Yes	- 0.1%	Yes	Yes	- 0.2%	Yes	Yes	0.0%	Yes	Yes	- 0.4%
Slovakia	Yes	Yes	0.0%	Yes	Yes	0.5%	Yes	Yes	- 0.3%	Yes	Yes	0.4%
Slovenia	No	No	1.9%	Yes	Yes	- 9.6%	Yes	Yes	0.3%	Yes	Yes	3.1%
Spain	No	No	- 0.6%	Yes	Yes	- 4.5%	Yes	Yes	- 0.5%	No	No	- 3.7%
Sweden	Yes	Yes	0.3%	Yes	Yes	- 3.4%	Yes	Yes	2.1%	Yes	Yes	- 0.3%
United Kingdom	Yes	Yes	1.1%	Yes	Yes	- 1.0%	Yes	Yes	3.0%	Yes	Yes	- 0.9%
EU-27	Yes	Yes	- 0.7%	Yes	Yes	4.1%	Yes	Yes	- 2.8%	Yes	Yes	5.0%

Notes: Negative percentage values mean that emission data of the latest 2014 submission are lower than the provisional data reported in 2013. The emission ceilings for this comparison are the emission ceilings set out in Annex I to the NECD.

2.3 Analysis of Member State emissions per pollutant

For the four NECD pollutants, Figures 2.2–2.5 illustrate the relative difference ⁽⁸⁾ between final 2010, 2011 and 2012, and provisional 2013 emissions and the respective emission ceilings. Positive percentage values indicate that emissions breached the emission ceiling.

The reported National Total of Austria, Belgium, Ireland, Luxembourg, the Netherlands and the United Kingdom are based on fuel used. All other Member States reported a National Total based on fuel sold. The aggregated EU-27 emission total is thus based on data for fuel used and for fuel sold. The emission ceilings for this comparison are those set out in Annex I to the NECD.

2.3.1 NO_x emissions

Analysis of the official final 2010 data indicates that 11 Member States exceeded their respective NO_x ceilings for that year (Austria, Belgium, Denmark, France, Germany, Ireland, Luxembourg, Malta, the Netherlands, Spain and Sweden). Eight Member States (Austria, Belgium, France, Germany, Ireland, Luxembourg, Slovenia and Spain) exceeded the ceiling in 2011. Nine Member States (the same eight Member States as for 2011, plus Malta) exceeded the NO_x emission ceiling in 2012. In 2013, six Member States (Austria, Belgium, France, Germany, Ireland, and Luxembourg) exceeded their ceilings. The highest exceedance in 2013 (in percentage terms) was reported for Luxembourg (41%).

The largest emitters of NO_x in 2013 were Germany, the United Kingdom, and France. Between 2012 and 2013, 25 Member States reported emission reductions. The total reduction for the EU-27 between 2012 and 2013 amounts to – 3.9%. The highest absolute reductions between 2012 and 2013 occurred in Spain, the United Kingdom and Romania.

Provisional 2013 NO_x emission data show that six Member States (Austria, Belgium, France, Germany, Ireland and Luxembourg) did not attain their ceilings in the year 2013 (see Figure 2.2).

2.3.2 NMVOC emissions

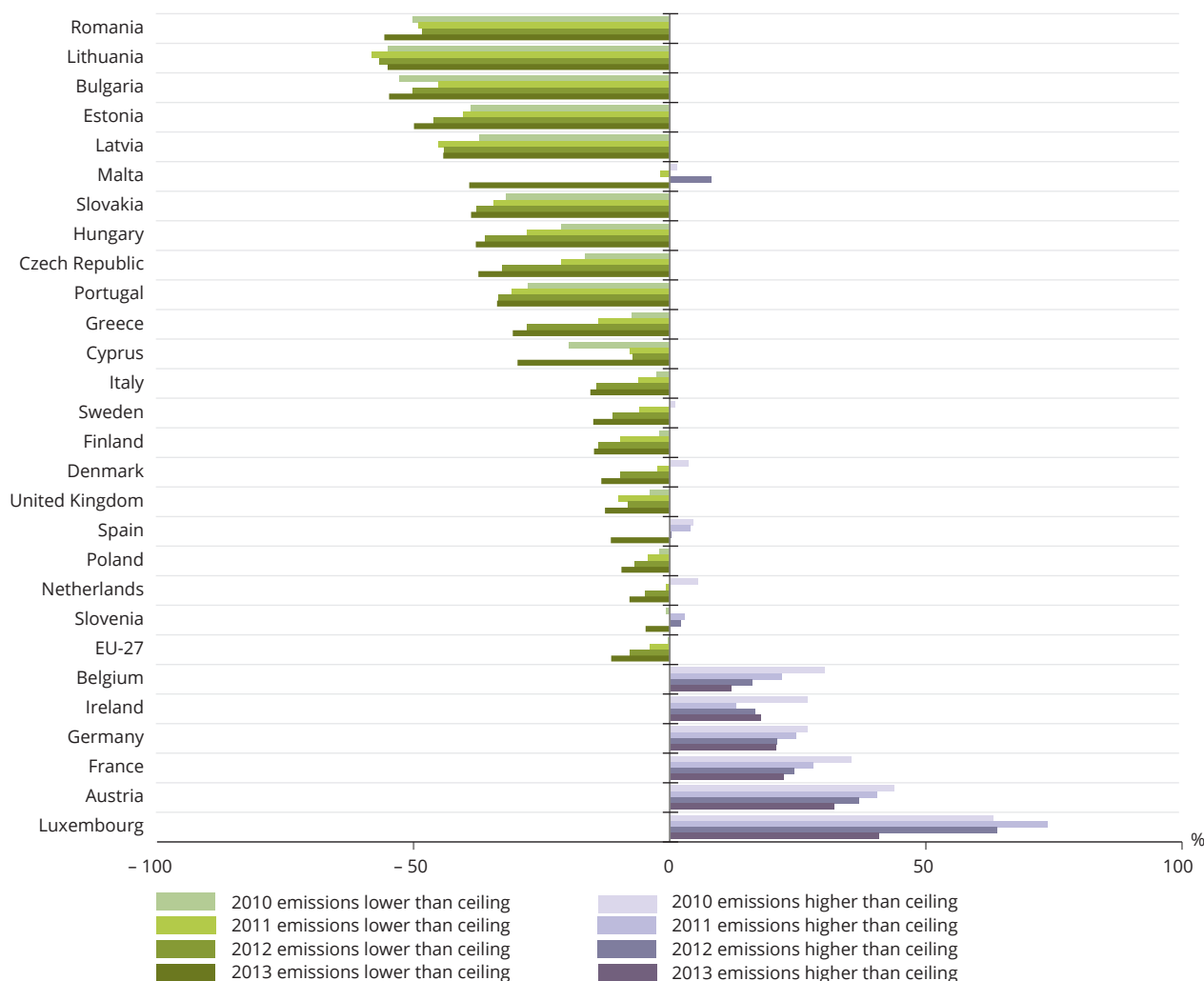
Emission data for NMVOCs are above the ceilings for four Member States (Belgium, Denmark, Germany and Ireland) in 2010 and 2012, and for five Member States in 2011 (the same four Member States, plus Slovenia). Provisional 2013 emission data of NMVOCs are above the ceilings for three Member States (Denmark, Germany and Ireland). The highest exceedance in 2013 (in percentage terms) was reported for Ireland (64%).

The largest emitters of NMVOCs in 2013 were Germany, Italy and the United Kingdom. Between 2012 and 2013, 19 Member States reported emission reductions. The total reduction for the EU-27 between 2012 and 2013 amounts to – 1.2%. The highest absolute reductions between 2012 and 2013 were achieved in Romania, the United Kingdom and Spain.

For 2013, the provisional emission data of 24 Member States fell below their respective ceilings (see Figure 2.3). Denmark, Germany and Ireland exceeded their ceilings in the year 2013.

Belgium, Denmark, Germany and Ireland reported a large difference between the provisional 2012 data (submitted in the previous reporting round) and the final 2012 data (Belgium + 32.7%, Denmark + 50%, Germany + 19.1% and Ireland + 104.9%). These increases change the attainment status of the four countries, and their NMVOC emissions of the year 2012 are now above their ceilings (see Table 2.3). The changes are primarily attributable to reporting of additional sources in the agriculture sector. The additional reporting of NMVOC emissions for agriculture also affects the attainment of the ceilings for Denmark, Germany and Ireland in 2013 (see Table 2.6).

⁽⁸⁾ The relative difference between emissions and the emission ceilings was estimated as $100 \times (E_{em} - E_{ceil})/E_{ceil}$ (%), where E_{em} are the emissions of years 2010, 2011, 2012 or 2013, respectively, and E_{ceil} is the 2010 Annex I ceiling value of the NECD.

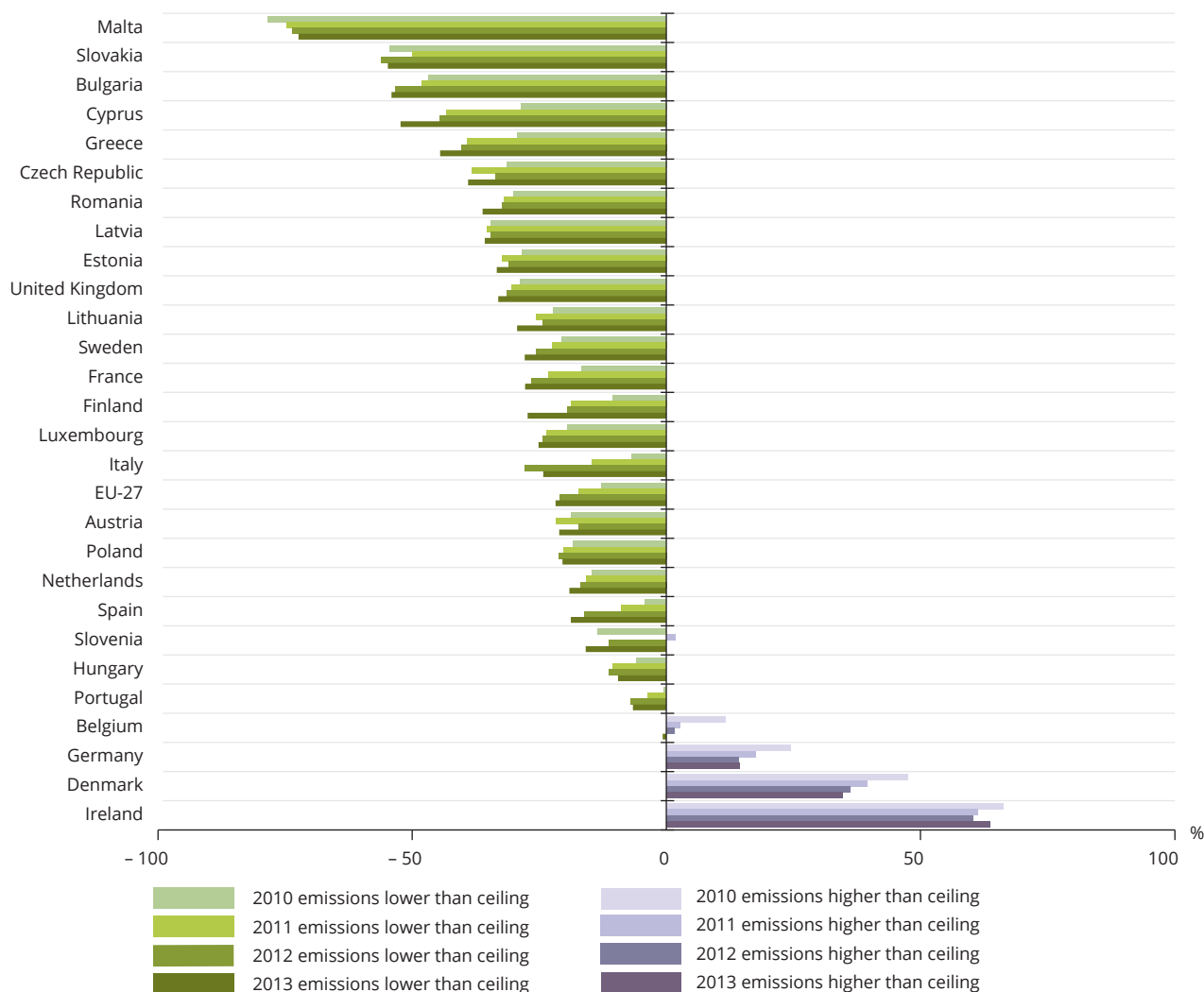
Figure 2.2 Distance from ceiling (%) for NO_x emissions in 2010, 2011, 2012 and 2013


Latvia reported a large difference between the provisional 2012 data (submitted in the previous reporting round) and the final 2012 data (+ 64.4%). The largest changes occurred within the 'Solvents' sector⁽⁹⁾ in several categories, with the biggest change in the category '2D3i — Other solvent use'. Other notable changes occurred owing to reporting of additional sources in the agriculture sector. Latvia stated (NEC report of Latvia, 2014) that recalculations in the 'Solvents' sector were carried out for two reasons: first, the list of NMVOCs substances was supplemented, and second, the time series consistency was performed using one method for the whole time series.

Provisional 2012 emission data (submitted in 2013) indicated that Luxembourg did not attain its NMVOC emission ceiling. However, recently submitted final 2012 emission data now indicate that Luxembourg's NMVOC emissions are below its ceiling. A large difference between the provisional 2012 data and the final 2012 data was reported (- 30.7%). This is mainly attributable to recalculations in the categories 2D3a (Domestic solvent use including fungicides) and 2D3d to 2D3i (Coating applications, Degreasing, Dry cleaning, Chemical products, Printing and Other solvent use).

⁽⁹⁾ According to the NECD sector aggregation used for the 'old' nomenclature for reporting (NFR-09) template.

Figure 2.3 Distance from ceiling (%) for NMVOC emissions in 2010, 2011, 2012 and 2013



2.3.3 SO₂ emissions

All Member States complied with the emission ceilings for SO₂.

The largest emitters of SO₂ in 2013 were Poland, Germany and the United Kingdom. Between 2012 and 2013, 23 EU Member States reported emission reductions. The total reduction for the EU-27 between 2012 and 2013 amounts to - 11.4%. The highest absolute reductions between 2012 and 2013 occurred in Bulgaria, Spain and Romania.

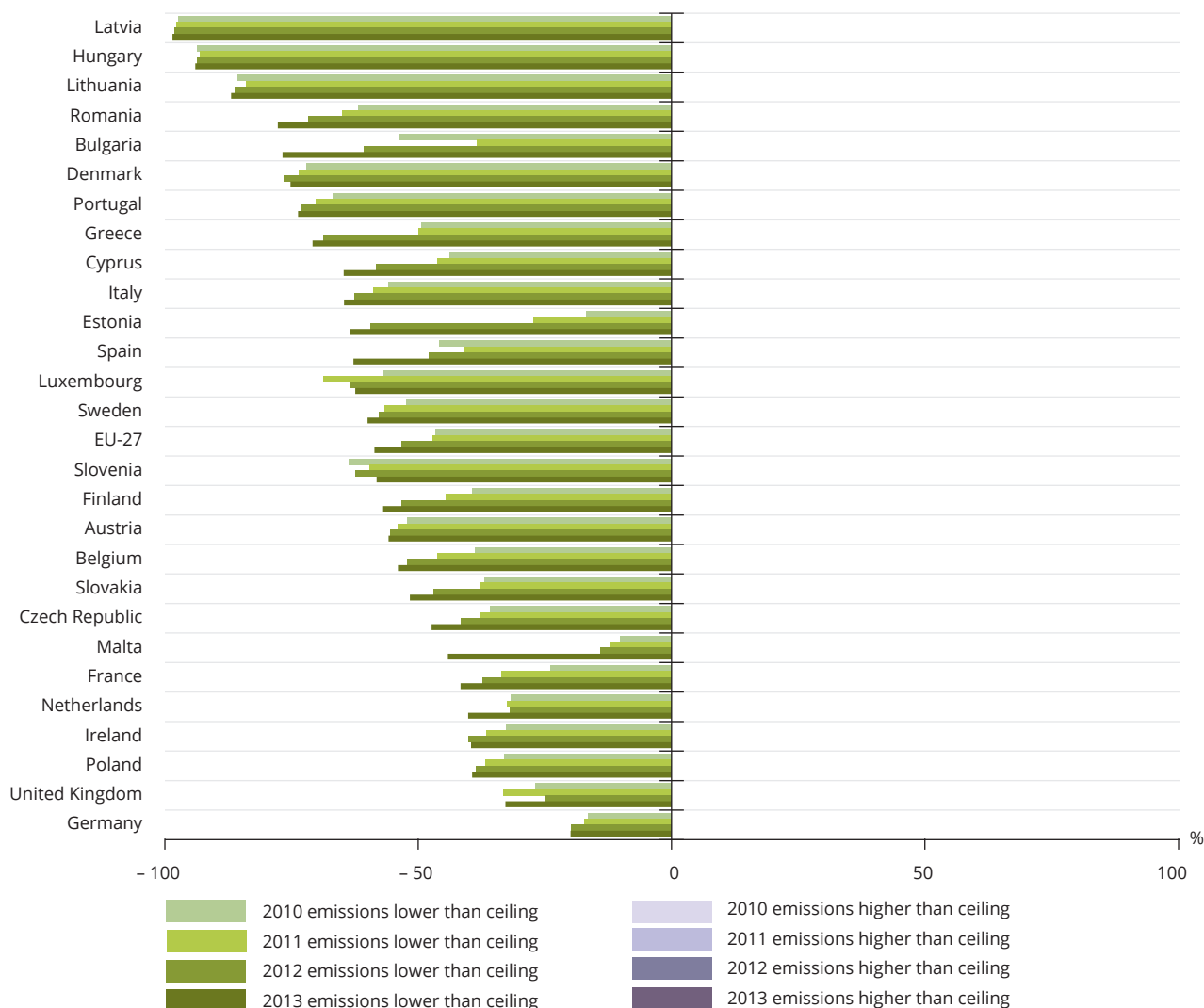
Final 2010, 2011, 2012 and provisional 2013 SO₂ emission data of all EU-27 Member States were below their respective ceilings (see Figure 2.4).

Lithuania reported very large differences between the provisional 2012 (submitted in the previous reporting round) and final 2012 data (- 45.0%). The highest changes occurred in the categories '1A1a — Public electricity and heat production', '1A2f — Stationary combustion in manufacturing industries and construction: Non-metallic minerals' and '1A4bi — Residential: Stationary'.

Greece reported major differences between the provisional 2012 and final 2012 data (- 33.1%). These differences arise from recalculations in the category '1A1a — Public Electricity and Heat Production'.

Likewise, Luxembourg reported major differences between the provisional 2012 and final 2012 data (- 26.6%). The highest change occurred in the

Figure 2.4 Distance from ceiling (%) for SO₂ emissions in 2010, 2011, 2012 and 2013



categories '1A4bi — Residential: Stationary' and '1A4ai — Commercial/institutional: Stationary'.

Reasons for the differences in data from Greece, Lithuania and Luxembourg can be analysed if these countries submit an informative inventory report.

2.3.4 NH₃ emissions

Emission data for NH₃ of the years 2010, 2011, 2012 (final data) and 2013 (provisional data) exceeded the ceilings in six Member States (Austria, Denmark, Finland, Germany, the Netherlands and Spain). The highest exceedance in 2013 (in percentage terms) was reported for Germany (22%).

The largest emitters of NH₃ in 2013 were France, Germany and Italy. Between 2012 and 2013, 16 of 27 EU Member States reported emission reductions. There was no reduction for the EU-27 between 2012 and 2013. The highest absolute reductions between 2012 and 2013 occurred in Italy, and the highest absolute increase in Germany.

Provisional NH₃ emission data show that six Member States (Austria, Denmark, Finland, Germany, the Netherlands and Spain) did not achieve their ceilings in the year 2013. The same six Member States exceeded their respective NH₃ ceilings in 2010, 2011 and 2012 (see Figure 2.5).

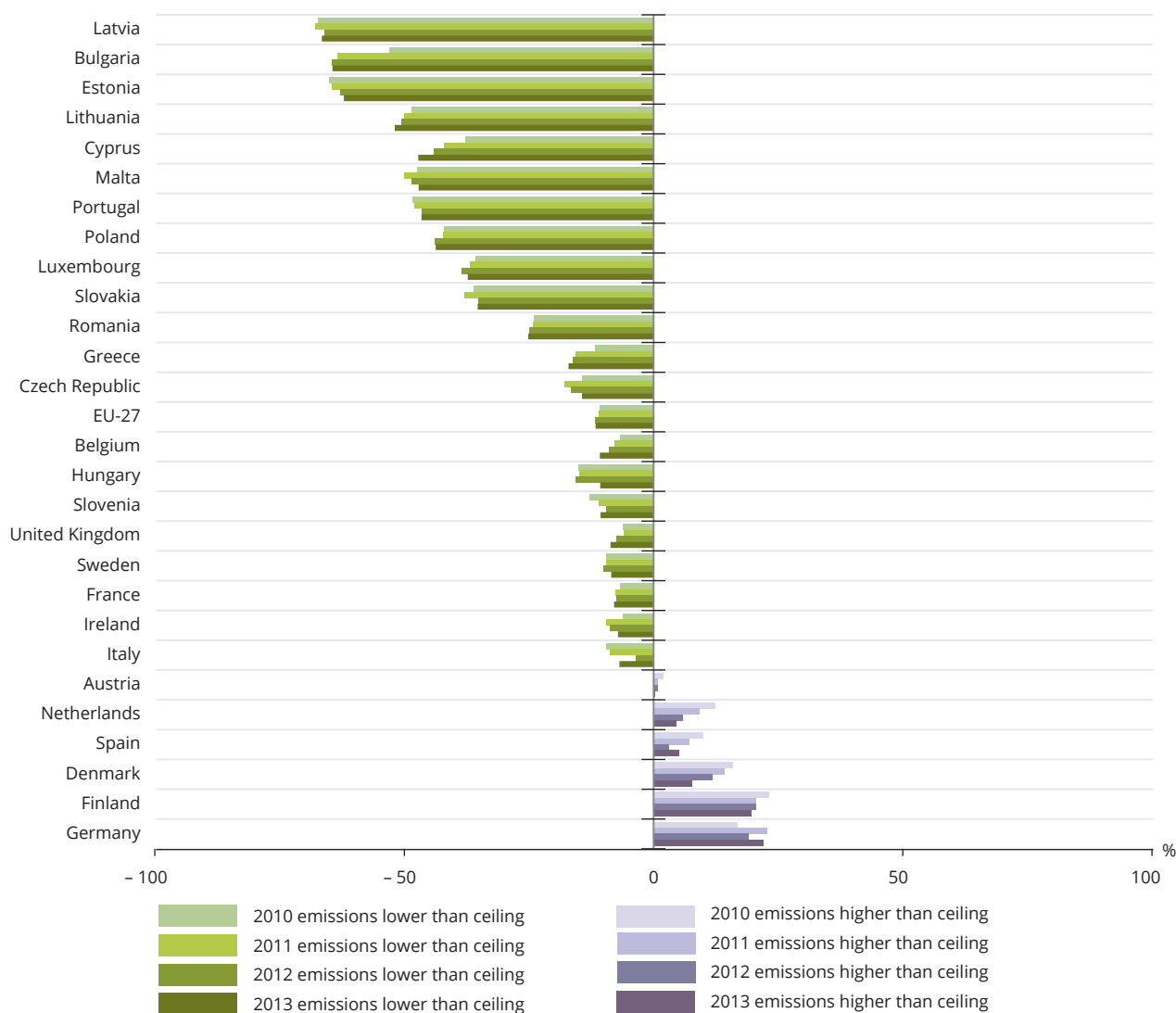
Austria reported an increase of NH₃ emissions when comparing the provisional 2012 data (submitted in the previous reporting round) and the final 2012 data. This changes the attainment status (see Table 2.3). The NH₃ emissions are now above the ceiling for the years from 2010 through 2013. The changes are primarily attributable to recalculations in the agriculture sector. Austria stated (NEC report of Austria, 2014) that in a new study, the Austrian inventory model for the sector agriculture was revised according to the 2006 IPCC Guidelines (IPCC, 2006) and the *EMEP/EEA air pollutant emission inventory guidebook* (EMEP/EEA, 2013). The Austrian sectorial inventory model follows the N-flow concept. The final 2012 NH₃ emissions however now exceed the ceiling — likewise for the years 2010, 2011 and 2013. The changes are primarily due to recalculations in the agriculture sector. Based on a new study, the Austrian inventory model for the

agriculture sector was revised. The Austrian sectorial inventory model follows the nitrogen (N-flow) concept. Due to the applied N balance model, which considers reactions throughout the N-flow in agricultural systems, the recalculations resulted in higher NH₃ emissions and lower N₂O emissions.

Also, Germany and the Netherlands reported increases in NH₃ emissions concerning provisional 2012 data and final 2012 data, i.e. towards non-attainment with their ceilings (see Table 2.3). The changes are primarily due to recalculations in the agriculture sector.

Hungary reported a large difference between the provisional 2012 data (submitted in the previous reporting round) and the final 2012 data (+ 29.0%). The changes again occurred in the agriculture sector.

Figure 2.5 Distance from ceiling (%) for NH₃ emissions in 2010, 2011, 2012 and 2013



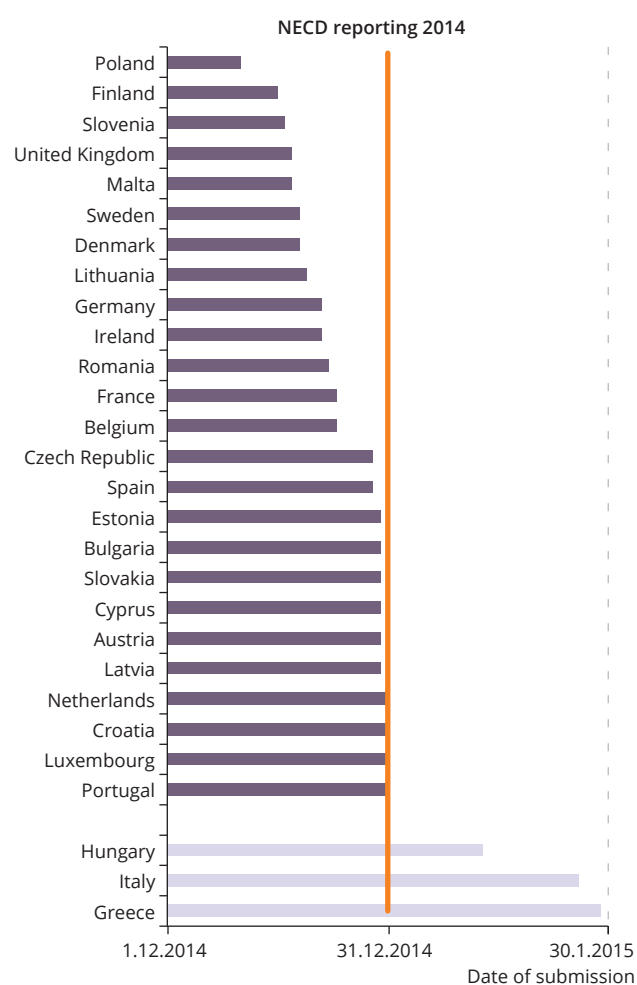
2.4 Timeliness and transparency of reporting

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

2.4.1 Timeliness and completeness

In the 2014 reporting cycle⁽¹⁰⁾, all Member States provided the mandatory information on final 2012 emissions and the provisional 2013 emission data. Three Member States submitted these data after the formal deadline for submission: Hungary, Italy and Greece (see Figure 2.6).

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



Data from the Member States must be compiled in order to allow comparison with the respective EU-27 ceilings as set out in Annexes I and II to the NECD. It is therefore extremely important that Member States report complete emission data sets.

2.4.2 Transparency of submitted information

Providing IIRs or explanatory information that describes the methods and sources of reported data is not mandatory under the NECD, meaning that the transparency of submitted information is rather limited. Nevertheless, 11 Member States (Austria, Croatia, Estonia, Finland, Germany, Latvia, Poland, Romania, the Netherlands, Slovakia and Sweden) voluntarily submitted an inventory report alongside their NECD inventories⁽¹¹⁾.

More detailed information about the quality of the 2014 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, 2015). Data described in this report are also available from the EEA online data viewer (EEA, 2015b).

2.5 Basis for estimating emissions from mobile sources

In preparing emission inventories and projections under the NECD, Member States should apply the principles outlined in the UNECE guidelines for reporting emission data under the LRTAP Convention (UNECE, 2014a). Article V/A, paragraph 22 of these guidelines specifies how emissions from transport should be reported: *'For emissions from transport, all Parties should calculate emissions consistent with national energy balances reported to Eurostat or the International Energy Agency. Emissions from road vehicle transport should therefore be calculated on the basis of the fuel sold in the Party concerned. In addition, Parties may voluntarily calculate 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.'*

Paragraph 23 of the guidelines details the basis for compliance checking: *'For Parties for which emission ceilings are derived from national energy projections based on the amount of fuels sold, compliance checking will be based on fuels sold in the geographic area of the Party. Other Parties within the EMEP region*

⁽¹⁰⁾ The reporting deadline for the 2014 reporting cycle was 31.12.2014.

⁽¹¹⁾ By comparison, 23 Member States submitted IIRs under the LRTAP Convention by 31 March 2015 (EEA, 2015a).

(i.e. Austria, Belgium, Ireland, Lithuania, Luxembourg, the Netherlands, Switzerland and the United Kingdom of Great Britain and Northern Ireland) 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 with their respective emission ceilings.'

The difference between transport emissions estimated using the amount of fuel sold within a country and emissions estimated using the amount of fuel consumed (i.e. fuel used) in a country can be relatively

large for countries where 'tank tourism' occurs, i.e. where fuel purchased within a country is actually used outside the country and vice versa. This can lead to omissions or double counting at EU level.

The sum of EU-27 emissions is based on information reported by Member States that includes both data on fuel used (6 Member States) and fuel sold (21 Member States). Table 2.4 gives an overview of related Member State reporting.

Table 2.4 Basis for estimating emissions from mobile sources in 2013

Member State	Road transport based on...	Two National Totals reported (based on fuel sold and fuel used)?
Austria ^(a)	Fuel used	Yes
Belgium ^(a)	Fuel used	Yes
Bulgaria	Fuel sold	No
Croatia	Fuel sold	No
Cyprus	Fuel sold	No
Czech Republic	Fuel sold	No
Denmark	Fuel sold	No
Estonia	Fuel sold	No
Finland	Fuel sold	No
France	Fuel sold	No
Germany	Fuel sold	No
Greece	Fuel sold	No
Hungary	Fuel sold	No
Ireland ^(a)	Fuel used	Yes
Italy	Fuel sold	No
Latvia	Fuel sold	No
Lithuania ^(a)	Fuel sold	No
Luxembourg ^(a)	Fuel used	Yes
Malta	Fuel sold	No
Netherlands ^(a)	Fuel used	No
Poland	Fuel sold	No
Portugal	Fuel sold	No
Romania	Fuel sold	No
Slovakia	Fuel sold	No
Slovenia	Fuel sold	No
Spain	Fuel sold	No
Sweden	Fuel sold	No
United Kingdom ^(a)	Fuel used	No

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

Marked entries means that those countries have not reported a National Total on the basis of fuel sold.

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

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

As a result, several (but not all) Member States now report emissions from 'new' pollutant–source category combinations not included in the original modelling. Examples of such combinations are NO_x and NMVOC emissions from the agriculture sector (NFR code 3) or NH₃ from the categories 3Da4 (Crop residues applied to soils) and 3De (Cultivated crops).

The *EMEP/EEA air pollutant emission inventory guidebook* (EMEP/EEA, 2013) provides Member States with default methodologies and emission factors that they can use in order to estimate emissions. Not all 'new' pollutant–source combinations are assigned a default method with default emission factors in the guidebook. This occurs, for example, when scientific evidence is deemed insufficient to recommend an emission factor as suitable for use across Europe. Nevertheless, in a number of Member States, national methods and data are available that have been applied to estimate emissions for these combinations.

2.6.1 Assessment of Member State reporting of NO_x and NMVOC emissions from the agriculture sector

The number of Member States that report emissions from the 'new' sources NO_x and NMVOCs from the agriculture sector in 2013 was assessed. This allows an assessment of the significance of emissions in these new categories compared to the reported National Totals for comparison with the national emissions

ceilings (see Tables 2.5 and 2.6). The NO_x and NMVOC emissions from all Member States and categories of the agriculture sector were also summed and compared with the total EU-27 emissions for the years 2010, 2011, 2012 and 2013 (see Table 2.7).

NO_x emissions from the agriculture sector (Table 2.5)

Data for NO_x from the agriculture sector were reported by 21 Member States for the year 2013. The share of National Total NO_x emissions attributed to agricultural activities was higher than 4% in only five countries (Hungary, Germany, Latvia, Croatia and Belgium). The exclusion from the National Total of NO_x emissions from the agriculture sector from the National Total does not change the attainment status of any Member State.

NMVOC emissions from the agriculture sector (Table 2.6)

Data for NMVOCs from the agriculture sector were reported by 23 Member States for the year 2013. The

share of National Total NMVOC emissions that was attributed to agricultural activities was significant (> 10%) in 11 countries. The exclusion from the National Total of NMVOC emissions from the agriculture sector would change the attainment status of three Member States Denmark and Germany and Ireland).

NO_x and NMVOC emissions from the agriculture sector at EU-27 level (Table 2.7)

At EU-27 level in 2013, deducting NO_x emissions from the agriculture sector amounts to 2.4% of the total emissions in 2013. For year 2012 data, excluding NO_x data from the agriculture sector would have brought the emissions below the EU Annex II ceiling. The subtraction of NMVOC emissions from the agriculture sector amounts to 8.5% of total emissions in 2013. In the year 2010, the exclusion of NMVOC data from the agriculture sector would have brought the emissions below the EU Annex II ceiling.

Table 2.5 Share of NO_x emissions from the agriculture sector to Member States' National Total, and comparison with NECD Annex I ceilings for 2013

Member State	Number of categories, where values were reported	Share of NO _x emissions on the National Total	Emissions (National Total) — ceiling comparison	Emissions (NT excl. NO _x from agriculture) — ceiling comparison
Hungary	14	11%	✓	✓
Germany	13	9%	✗	✗
Latvia	10	6%	✓	✓
Croatia	12	6%	✓	✓
Belgium	12	5%	✗	✗
Austria	16	4%	✗	✗
Estonia	9	4%	✓	✓
Slovenia	13	4%	✓	✓
Portugal	16	3%	✓	✓
Bulgaria	1	3%	✓	✓
Spain	2	2%	✓	✓
Luxembourg	1	2%	✗	✗
Poland	1	1%	✓	✓
Netherlands	11	1%	✓	✓
Cyprus	12	1%	✓	✓
Greece	1	1%	✓	✓
Denmark	14	1%	✓	✓
Romania	8	< 1%	✓	✓
France	1	< 1%	✗	✗
Italy	1	< 1%	✓	✓
Finland	1	< 1%	✓	✓

Notes: '✓' indicates that provisional emission data reported by a Member State meet or lie below the respective emission ceiling.
'✗' indicates that a ceiling has not been attained.

Table 2.6 Share of NMVOC emissions from the agriculture sector to Member States' National Total, and comparison with the NECD Annex I ceilings for 2013

Member State	Number of agricultural source categories	Share of agricultural NMVOC emissions of the National Total	Emissions (National Total) — ceiling comparison	Emissions (NT excl. NMVOCs from agriculture) — ceiling comparison
Ireland	13	47%	*	✓
Denmark	13	33%	*	✓
Bulgaria	2	27%	✓	✓
Belgium	11	27%	✓	✓
Cyprus	12	22%	✓	✓
Romania	7	19%	✓	✓
Germany	11	18%	*	✓
Hungary	14	17%	✓	✓
Slovenia	11	16%	✓	✓
Estonia	8	12%	✓	✓
United Kingdom	7	12%	✓	✓
Latvia	9	8%	✓	✓
Spain	1	7%	✓	✓
Luxembourg	1	3%	✓	✓
Croatia	1	1%	✓	✓
Austria	2	1%	✓	✓
Portugal	15	1%	✓	✓
Slovakia	1	1%	✓	✓
France	1	< 1%	✓	✓
Finland	1	< 1%	✓	✓
Poland	2	< 1%	✓	✓
Italy	9	< 1%	✓	✓
Netherlands	1	< 1%	✓	✓

Notes: '✓' indicates that provisional emission data reported by a Member State meet or lie below the respective emission ceiling.
 '*' indicates that a ceiling has not been attained.

Table 2.7 Effect on NO_x and NMVOC emissions of the 'new' emission source categories within the agriculture sector on EU total emissions

		EU-27 emissions as reported (Gg)	Amount of the agriculture sector (Gg)	EU-27 without emissions from the agriculture sector (Gg)	EU-27 emissions — ceiling (Annex I) comparison	EU-27 emissions (excl. agric.) — ceiling (Annex I) comparison	EU-27 emissions — ceiling (Annex II) comparison	EU-27 emissions (excl. agric.) — ceiling (Annex II) comparison
NO _x	2010	8 978	178	8 800	✓	✓	*	*
	2011	8 649	188	8 461	✓	✓	*	*
	2012	8 302	187	8 115	✓	✓	*	✓
	2013	7 976	191	7 785	✓	✓	✓	✓
NMVOCs	2010	7 719	510	7 209	✓	✓	*	✓
	2011	7 322	511	6 810	✓	✓	✓	✓
	2012	7 003	584	6 419	✓	✓	✓	✓
	2013	6 922	588	6 334	✓	✓	✓	✓

Notes: '✓' indicates that provisional emission data meet or lie below the respective emission ceiling.
 '*' indicates that a ceiling has not been attained.

2.6.2 Assessment of Member State reporting NH₃ from the categories 3Da4 and 3De

A further assessment was performed to assess the number of Member States that report NH₃ emissions from the 'new' sources '3Da4 — Crop residues applied to soil' and '3De — Cultivated crops'. The shares of emissions from these categories relative to the Member States' National Totals were calculated and comparisons with the national emissions ceilings were made (see Table 2.8).

Data for NH₃ from the categories 3Da4 and 3De were reported by only three Member States (Austria, Denmark and the Netherlands) for the year 2013. The share of national total NH₃ emissions was the highest for Denmark (7.2%); here, and also for Austria, the exclusion from NH₃ emissions of these categories from the National Total would change the attainment status of Denmark and Austria.

This research demonstrates that incomplete reporting coupled with the apparent significant contribution of such sources to National Totals may well cause emissions to be underestimated in a number of Member States, in some cases significantly so.

Table 2.8 Reporting and share of NH₃ emissions from categories 'Crop residues applied to soil' and 'Cultivated crops' to Member States' National Total of 2013, and comparison with NECD Annex I ceilings

Member State	Reporting of the category '3Da4 — Crop residues applied to soils'	Reporting of the category '3De — Cultivated crops'	% of the categories 3Da4 and 3De of the National Total	Emissions (National Total) — ceiling comparison	Emissions (NT excl. 3Da4 and 3De) — ceiling comparison
Austria	NO	0.28	0.4%	✘	✓
Belgium	NA	NE		✓	✓
Bulgaria	NA	NA		✓	✓
Croatia	IE	IE		✘	✘
Cyprus	NE	NO		✓	✓
Czech Republic	NE	NE		✓	✓
Denmark	NA	5.37	7.2%	✘	✓
Estonia	NA	NA		✓	✓
Finland	IE	NA		✘	✘
France	NO	NO		✓	✓
Germany	NA	NA		✘	✘
Greece				✓	✓
Hungary	NA	NA		✓	✓
Ireland	NE	NE		✓	✓
Italy				✓	✓
Latvia	IE	NA		✓	✓
Lithuania	NE	NE		✓	✓
Luxembourg	NE	NA		✓	✓
Malta	NE	NE		✓	✓
Netherlands	2.25	1.82	3.0%	✘	✘
Poland	NA	NA		✓	✓
Portugal	NA	NE		✓	✓
Romania				✓	✓
Slovakia	NE	NE		✓	✓
Slovenia	NO	NO		✓	✓
Spain	NA	IE		✘	✘
Sweden				✓	✓
United Kingdom	NA	NA		✓	✓

Notes: '✓' indicates that provisional emission data reported by a Member State meet or lie below the respective emission ceiling.
 '✘' indicates that a ceiling has not been attained.

2.6.3 Reporting of the notation key 'NE' (not estimated)

The official reporting guidelines of the LRTAP Convention (UNECE, 2014a) (and through Annex III to the NECD, by extension applicable also to reporting under the NECD) allow countries to report emissions as 'NE' for those sectors where emissions are known to occur but have not been estimated or reported.

Countries should report separately the reasons for not estimating emissions. Concerning 'NE' emissions, the *EMEP/EEA air pollutant emission inventory guidebook* (EMEP/EEA, 2013) recommends that the following be included in an IIR:

- 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.

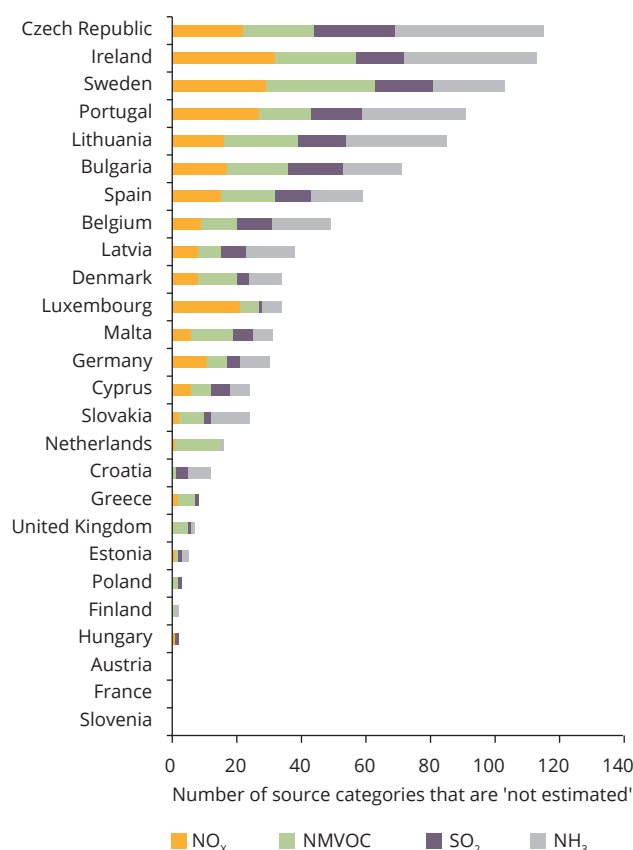
Certain Member States used the notation key 'NE' for a considerable number of source categories (see Figure 2.7).

Only nine Member States provided reasons for using it in their data submissions under the NECD, and it should be noted that Member States provided more information under their LRTAP Convention submissions (the reporting deadline was 15 February). However, the information provided varied somewhat in terms of informative value.

The analysis of reporting of the notation key 'NE' (Figure 2.7) did not consider that in several cases different countries report different notation keys for the same category (e.g. a country reported 'NA', another country reported 'NE' for the same category),

or even reported 'NA' for a category where other countries report emissions. Such instances also can lead to a wrong interpretation of the inventory completeness.

Figure 2.7 Number of Member State 'not estimated' source categories for NO_x, NMVOCs, SO₂ and NH₃ for data of the year 2013



Notes: Romania and Italy are not included in this analysis, as these countries used a reporting format older than the NFR 2014, and therefore comparability would have been not ensured.

3 Summary and recommendations

This chapter summarises the information reported by the Member States and the various issues encountered in compiling the inventory submissions. Recommendations for improving current reporting processes are also presented.

3.1 Emission trends and ceiling assessments

Comparison of final 2010 emission estimates and ceilings

A total of 12 Member States reported emission data above the ceiling of at least one pollutant. The final emission data exceed the respective ceilings for three of the four pollutants in Denmark and Germany (NO_x, NMVOCs and NH₃) and for two ceilings in Austria, Belgium, Ireland, Spain and the Netherlands.

Comparison of final 2011 emission estimates and ceilings

A total of 11 Member States reported emission data above the ceiling of at least one pollutant, based on final 2011 data. The final emission data exceed the respective ceilings for three of the four pollutants in Germany and for two in Austria, Belgium, Denmark, Ireland, Slovenia and Spain.

Comparison of final 2012 emission estimates and ceilings

A total of 12 Member States reported emission data above the ceiling of at least one pollutant. The final 2012 emission data exceed the respective ceilings for three of the four pollutants in Germany and for two

ceilings in Austria, Belgium, Denmark, Ireland and Spain.

Comparison of provisional 2013 emission estimates and ceilings

A total of 10 Member States reported emission data above the ceiling of at least one pollutant. The provisional 2013 emission data exceed the respective ceilings for three of the four pollutants in Germany (NO_x, NMVOCs and NH₃) and for two ceilings in Austria, Denmark and Ireland.

Based on provisional 2013 emissions data, the highest number of ceiling exceedances was reported for NO_x and NH₃ (six Member States, each). Three Member States reported provisional 2013 emission data for NMVOCs above the ceiling. All Member States continue to meet their SO₂ ceilings. The emission data for NH₃ has not changed much at EU-27 level over the last 4 years. Over the years 2010 to 2013 the same six Member States exceeded their NH₃ ceiling

Emission trends

The NECD does not formally require Member States to report complete emission time-series data back to 1990. Between 2012 and 2013, emission reductions were reported by about three-quarters of the Member States for NO_x and SO₂, and by more than two-thirds of the EU Member States for SO₂. For NH₃, emission reductions were reported by more than half of the Member States. A more complete picture of past emission trends in the EU will be available in mid-2015, when the EEA publishes its annual EU emission inventory report under the LRTAP Convention (EEA, 2015a).

Completeness of 2013 emissions compared to ceilings

Since the original integrated assessment modelling undertaken in support of determining the 2010 emissions ceilings, knowledge on the sources of air pollutants has advanced. Examples of reporting emissions from 'new' pollutant-source category combinations that were not included in the original modelling are NO_x and NMVOC emissions from the agriculture sector, or NH₃ from the categories 3Da4 and 3De.

Reporting of NO_x and NMVOC emissions of the agriculture sector has increased in recent years. In the 2011 reporting round, only 17 Member States reported data for NO_x and NMVOCs of the agriculture sector. In the 2014 reporting round, NO_x data were reported by 21 Member States, and NMVOC data by 23 countries. 2013 data for NH₃ from the categories 3Da4 and 3De were reported by only three Member States.

A number of Member States used the notation key 'NE' to indicate that emissions from specific source categories were not estimated. Member States are encouraged to review and limit their use of the 'NE' notation key when reporting emission data in future, and to provide numerical estimates where relevant and applicable.

3.2 Outlook post-2013

The NECD called for emission ceilings to be complied with by 2010, and to not be exceeded in any year following. In addition to those Member States that report exceedances, it is noted that several others have reported emissions for 2013 which lie just below the value of their respective ceilings, e.g. Slovenia for NO_x and Belgium for NMVOCs. It is essential that all Member States take appropriate measures to limit any future increases in emissions which would result in their ceilings being exceeded.

3.3 Recommended improvements in reporting methodology

Improving the completeness of Member States' reporting in line with the reporting criteria of the EMEP reporting guidelines is key. Classifying specific emission source categories as 'NE' should be limited only to insignificant sources of emissions, in accordance with the definitions included in the reporting guidelines. Incomplete emission inventories hamper the judgement of compliance by the European Commission, especially for those countries where emissions are very close to the ceilings. The reporting of the best-performing Member States might be used to establish a benchmark that could encourage others to develop more comprehensive reporting over the next few years.

To help improve the transparency of the reported NECD data, it is always recommended that Member States submit an accompanying inventory or NECD report. Such a report should include explanatory information on the reported inventory: clarifying whether the reporting is on the basis of fuel used or sold, providing an explanation for time series changes and recalculations, addressing document uncertainties, etc.

It is also important to improve the transparency of measures taken by Member States and the contribution of these measures to meeting the national emission ceilings, e.g. the anticipated impacts of current and planned measures on future emissions.

The European Commission's proposal for a revised NECD (see Box ES. 1) includes several new additional elements in addition to the continuing requirement that Member States annually prepare and report national emission inventories and projections for the main air pollutants (but also now including primary PM_{2.5}). These include that emission inventories and projections shall be accompanied by an informative inventory report (IIR), and that a review process will be introduced under the NECD to assist with the further improvement of emission inventories.

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Appendix 1 Data sources

The table below presents an overview of the emission data and data sources used for this report, as of 7 April 2015. Several Member States submitted updated

emission data under NECD reporting, for all years as far back as 1990. These data are available from the EEA online data viewer (EEA, 2015b).

Table A1.1 Inventory submissions

	Final 2010 emission data (Gg)				Final 2011 emission data (Gg)				Final 2012 emission data (Gg)				Preliminary 2013 emission data (Gg)				2013 data for road transport based on
	NO _x	NMVOCs	SO ₂	NH ₃	NO _x	NMVOCs	SO ₂	NH ₃	NO _x	NMVOCs	SO ₂	NH ₃	NO _x	NMVOCs	SO ₂	NH ₃	
Austria*	148	129	19	67	145	125	18	67	141	132	17	67	136	125	17	66	Fuel used
Belgium* (e)	229	155	61	69	214	143	53	68	204	141	47	67	197	138	46	66	Fuel used
Bulgaria	117	93	387	51	136	91	515	39	123	82	329	38	112	80	194	38	Fuel sold
Croatia	64	55	35	39	60	53	29	39	56	49	25	39	56	46	16	34	Fuel sold
Cyprus	19	10	22	6	21	8	21	5	21	8	16	5	16	7	14	5	Fuel sold
Czech Republic	239	151	170	69	225	136	165	66	193	146	155	67	179	134	139	69	Fuel sold
Denmark (b)	132	125	15	80	124	119	15	79	115	116	13	77	110	114	14	74	Fuel sold
Estonia	37	35	83	10	36	33	73	10	32	34	41	11	30	33	36	11	Fuel sold
Finland	167	116	67	38	154	106	61	37	147	105	51	37	145	95	47	37	Fuel sold
France	1 096	874	285	729	1 036	807	249	721	1 008	772	235	722	990	758	219	718	Fuel sold
Germany (b)	1 334	1 239	434	643	1 311	1 169	431	675	1 270	1 136	417	655	1 269	1 138	416	671	Fuel sold
Greece	319	185	265	64	296	159	262	62	248	156	164	61	239	145	152	61	Fuel sold
Hungary	156	129	32	76	143	123	35	77	127	122	32	76	123	124	30	80	Fuel sold
Ireland* (e)	82	91	28	109	73	89	27	105	76	88	25	106	77	90	25	108	Fuel used
Italy	964	1 080	210	379	930	989	195	382	849	836	178	404	837	878	168	390	Fuel sold
Latvia	38	89	3	14	33	88	2	14	34	89	2	15	34	87	2	15	Fuel sold
Lithuania*	50	71	21	43	46	69	23	42	48	70	20	42	49	65	19	40	Fuel sold
Luxembourg*	18	7	2	5	19	7	1	4	18	7	1	4	15	7	2	4	Fuel used
Malta	8	3	8	2	8	3	8	1	9	3	8	2	5	3	5	2	Fuel sold
Netherlands*	274	158	34	144	258	156	34	140	248	154	34	136	240	150	30	134	Fuel used
Poland	861	653	937	271	842	638	885	271	819	630	859	263	796	636	847	263	Fuel sold
Portugal	181	179	53	47	173	173	48	47	167	167	43	48	166	168	42	48	Fuel sold
Romania	218	365	350	160	223	356	322	159	226	354	260	158	194	334	205	157	Fuel sold
Slovakia	89	64	69	25	85	70	68	24	81	61	58	25	80	63	53	25	Fuel sold
Slovenia	45	35	10	17	46	41	11	18	46	35	10	18	43	34	11	18	Fuel sold
Spain	886	634	404	388	881	603	440	378	850	556	388	364	750	538	278	371	Fuel sold
Sweden	150	192	32	52	139	187	29	52	131	179	28	51	126	174	27	52	Fuel sold
United Kingdom*	1 123	855	428	279	1 051	835	391	279	1 073	824	440	275	1 020	803	393	271	Fuel used

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

(e) Excluding adjustments.

(b) Under the Gothenburg Protocol, inventory adjustments applications for emissions from Germany (for NO_x) and Denmark (for NH₃), were accepted by the EMEP Steering Body in 2014. However, emission data used in this report and shown in this table are unadjusted. Adjusted emissions of the year 2012 amounts to 1 072 Gg (NO_x for Germany) and 68 Gg (NH₃ for Denmark) (UNECE, 2014b). Adjusted data for 2013 are not available yet.

Red: Inventory submission with the reporting deadline of 31 December 2012.

Green: Inventory submission with the reporting deadline of 31 December 2013.

Blue: Inventory submission with the reporting deadline of 31 December 2014.

Appendix 2 Reporting status of NECD emissions

The status of reporting NECD emissions (the 2014 reporting round) as of 7 April 2015 is shown in Table A2.1.

Table A2.1 Submission overview

Member State	Submission uploaded to CDR	Re-submissions	Years covered	Format	NO _x , NMVOCs, SO ₂ , NH ₃		Projections table	Updated NECD programmes	Socio-economic data (Annex IV B)	IIR
					2012 final	2013 provisional				
Austria	30.12.2014	12.02.2015	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	30.12.2014 12.02.2015
Belgium	24.12.2014	n/a	1990, 1995, 2000, 2005, 2010–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Bulgaria	30.12.2014	07.01.2015	2012–2013	NFR 2014-1	x	x	2015, 2020	n/a	n/a	np
Croatia	31.12.2014	11.02.2015	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	31.12.2014 16.03.2015
Cyprus	30.12.2014	13.02.2015	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Czech Republic	29.12.2014	n/a	2012–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Denmark	19.12.2014	n/a	1980–2013	NFR 2014-1	x	x	2020, 2025, 2030	n/a	n/a	np
Estonia	30.12.2014	n/a	1990–2013	NFR 2014-1	x	x	2020, 2025, 2030	n/a	n/a	30/12/2014
Finland	16.12.2014	13.02.2015 27.02.2015	1980–2013	NFR 2014-1	x	x	2020, 2025, 2030, 2050 (NH ₃)	n/a	x	16.12.2014
France	24.12.2014	n/a	1980–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Germany	22.12.2014	n/a	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	22.12.2014
Greece	29.01.2015	31.01.2015	2012–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Hungary	13.01.2015	n/a	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Ireland	22.12.2014	21.01.2015	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Italy	26.01.2015	n/a	2012–2013	NFR 2008-1	x	x	np	n/a	n/a	np
Latvia	30.12.2014	24.03.2015	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	30.12.2014
Lithuania	20.12.2014	n/a	1990–2013	NFR 2014-1	x	x	2015, 2020	n/a	x	np
Luxembourg	31.12.2014	n/a	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Malta	18.12.2014	19.01.2015	2000–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Netherlands	31.12.2014	15.02.2015	1990–2013	NFR 2014-1	x	x	2020, 2030	n/a	n/a	15.03.2015
Poland	11.12.2014	n/a	1995–2013	NFR 2014-1	x	x	np	n/a	n/a	11.12.2014 30.03.2015
Portugal	31.12.2014	n/a	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Romania	23.12.2014	n/a	2012–2013	NFR 2009-1	x	x	np	n/a	n/a	23.12.2014
Slovakia	30.12.2014	n/a	2000–2013	NFR 2014-1	x	x	np	n/a	n/a	30.12.2014
Slovenia	17.12.2014	n/a	2012–2013	NFR 2014-1	x	x	2020, 2025, 2030	n/a	x	np
Spain	29.12.2014	n/a	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	np
Sweden	19.12.2014	10.02.2015	1990–2013	NFR 2014-1	x	x	np	n/a	n/a	"19.12.2014, 10.02.2015"
United Kingdom	18.12.2014	n/a	2009–2013	NFR 2014-1	x	x	np	n/a	n/a	np

Notes: 'np' denotes 'not provided'.

'x' denotes 'provided'.

'NFR' denotes 'nomenclature for reporting' — the sectoral classification system developed by UNECE/EMEP for reporting air emissions. Values in red indicate that data were not received by the reporting deadline of 31 December 2014 and/or are not in the new NFR 2014 reporting format.

European Environment Agency

NEC Directive status report 2014

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