National Emission Ceilings (NEC) Directive

NEC Directive reporting status 2017 - The need to reduce air pollution in Europe

Air pollution is the single largest environmental health risk in Europe, and can cause respiratory problems and shorten lifespans. It also contributes to the acidification of soil and surface water, causes eutrophication in sensitive habitats and can damage vegetation through exposure to ozone (EEA, 2016).

This briefing presents progress made by the EU[1] and Member States in meeting their emission ceilings that are applicable since 2010[2] and which remain applicable until 2019 under the new National Emission Ceilings (NEC) Directive; (EU) ; EU, 2016). The new NEC Directive also sets emission reduction commitments applicable for the years 2020 to 2029 while greater reduction commitments will take effect as from 2030. The analysis is based on the latest air pollutant emissions inventory data for 2010 to 2015 reported by Member States in February 2017. The briefing also provides an assessment of the projected emissions for 2020 and 2030 reported by Member States[3] in relation to their individual reduction commitments set in the new NEC Directive for these years.

Key messages

- In 2015, the total EU emissions of four important air pollutants, nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOCs), sulphur dioxide (SO_2) and ammonia (NH_3), were below their respective 2010 ceilings.
- While emissions of these air pollutants have reduced in the EU since 2010, for the second consecutive year emissions of NH_3 increased across the EU, by 1.7 % from 2014 to 2015, due to higher reported emissions from the agriculture sector.
- In 2015, eleven Member States exceeded for one or more pollutants their NEC Directive national ceilings (see table 1). Germany exceeded three ceilings in 2015, namely for NO_x, NMVOCs and NH_3. Four Member States (Austria, Denmark, Ireland and Luxembourg) exceeded two ceilings in 2015.

Air pollution

- For all years from 2010 to 2015, six Member States have persistently exceeded their respective emission ceilings for NO_x (Austria, Belgium, France, Germany, Ireland and Luxembourg), three for NMVOCs (Denmark, Germany and Ireland) and six for NH_3 (Austria, Denmark, Finland, Germany, Spain and Sweden). No Member State exceeded its SO_2 ceiling.
- However, the new NEC Directive allows Member States under certain circumstances to 'adjust' downwards their reported emissions for compliance assessment with the national ceilings. In 2017, adjustment applications were submitted by nine Member States (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Luxembourg and Spain). Following a review of these applications by the European Commission, and if approved, the number of Member States exceeding one or more emission ceilings in 2015 is expected to decrease from 11 to 5, with emissions from Belgium, Denmark, Finland, France, Ireland and Luxembourg now being below all of their respective ceilings. Austria would be very close to meeting all of its ceilings. Germany and Spain would still exceed their NH_3 ceilings.
- In 2015, the aggregated EU emissions for two pollutants (NMVOCs, SO_2) were already below the respective levels of the EU's 2020 emission reduction commitment set for these pollutants. Emissions of NH_3 and fine particulate matter $PM_{2.5}$are also already very close to the respective 2020 reduction commitments for the EU. Only for NO_x a further, more significant, reduction of 9 % is required by the EU as a whole in order to meet the 2020 commitment. In contrast, more substantial reductions are still needed for all pollutants if the EU is to achieve its 2030 emission reduction commitments.
- Projected emissions reported show that 18 Member States do not consider themselves on track towards meeting their reduction commitments set for 2020 for NO_x, NH_3, NMVOCs, SO_2 and/or $PM_{2.5}$ on the basis of policies and measures currently in place. Similarly, 22 countries are not on track for one or more of their 2030 commitments. In accordance with the new NEC Directive Member States have to report by April 2019 their 'national air pollution control programmes' which have to set out the additional emission reduction measures that need to be implemented so that these countries reach their future emission reduction commitments.

Comparison of Member State emissions with NEC Directive ceilings, and 2020 and 2030 emission reduction commitments

The new NEC Directive ensures that emission ceilings that had to be met by the year 2010 (as set in the 2001 NEC Directive) remain applicable until 2019, after which new emission reduction commitments for the years 2020 to 2029, and later 2030 onwards, become applicable. Under the new NEC Directive, Member States report each year emission inventory information for the past years (from 1990 (or 2000 in case of $PM_{2.5}$) until the current year minus 2). Every second year emission projections for SO_2, NO_x, NH_3, NMVOCs, $PM_{2.5}$ and, if available, black carbon (BC) must be reported. The projections shall cover the years 2020, 2025, 2030 and, where available, 2040 and 2050. Projected emissions are used to assess whether or not Member States are on track towards meeting their reduction commitments for 2020 and 2030 (see Table 1).

Box 1: 'Adjustments' to emission inventories under the new NEC Directive

Consistent with a similar procedure agreed to by Parties under the Gothenburg Protocol of the LRTAP Convention, the new NEC Directive establishes a process that allows Member States to 'adjust' the reported emissions in their emission inventories downwards if exceedances of the national ceilings are caused by countries having applied improved emission inventory methods in accordance with updated scientific knowledge since the time the 2010 ceilings were originally set.

Member States wishing to adjust their data in this way must first notify the European Commission (by 15 February of each year), and subsequently submit a range of documentation (by 15 March each year) for review by the Commission. Reviews of the adjustment applications submitted in 2017 have not yet been finalized and therefore cannot yet be considered as 'official' data. **Thus, the data provided in this briefing are based on unadjusted emission totals, and the number of exceeded ceilings shown for Member States in Table 1 will be lower if the adjustment applications are approved**.

Air pollution

Table 1: EU Member State progress in meeting 2010 NEC Directive emission ceilings and 2020/2030 reduction commitments

Member State	NO_x									NMVOCs									SO_2									NH_3									$PM_{2.5}$	
	reported emissions vs. 2010 ceilings					WM proj. vs. reduction commitments		reported emissions vs. 2010 ceilings					WM proj. vs. reduction commitments		reported emissions vs. 2010 ceilings					WM proj. vs. reduction commitments		reported emissions vs. 2010 ceilings					WM proj. vs. reduction commitments		WM proj. vs. reduction commitments		reported emissions vs. 2010 ceilings					WM proj. vs. reduction commitments	
	2010	11	12	13	14	15	2020	2030	2010	11	12	13	14	15	2020	2030	2010	11	12	13	14	15	2020	2030	2010	11	12	13	14	15	2020	2030	2020	2030	2020	2030
Austria	×	×	×	×	×	×	✓	×	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	✓	✓	×	×	×	×	×	×	×	×			✓	×		
Belgium	×	×	×	×	×	×	✓	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓
Bulgaria	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×	×	×
Croatia					✓	✓	✓	✓					✓	✓	✓	✓					✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
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	✓	✓	✓	✓	✓	✓	×	×	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	✓	✓	✓	✓	✓	×	×	×	×	×	×
✓	13	15	16	20	21	21	16	8	20	22	21	21	24	22	15	7	26	26	26	26	27	27	22	11	18	19	20	20	21	21	11	7	18	9				
×	13	11	10	6	6	6	7	15	6	4	5	5	3	5	8	16	0	0	0	0	0	0	1	12	8	7	6	6	6	6	12	16	5	14				

Air pollution

Source: National Emission Ceilings (NEC) Directive emission inventory data

Notes:

'  ' indicates that the emission ceiling or reduction commitment has been, or is anticipated to be, attained. The 2001 NEC Directive does not include a 2010 ceiling for $PM_{2.5}$.

'  ' indicates that the ceiling or reduction commitment has not been, or is not anticipated to be, attained.

Greece did not report data in 2017.

The comparison with current emission ceilings is calculated based on **unadjusted** emissions. Following a review of submitted adjustment applications by the European Commission, and if approved, the number of Member States exceeding one or more emission ceilings in 2015 would decrease from 11 to 5, with emissions from Belgium, Denmark, Finland, France, Ireland and Luxembourg now being below all of their respective ceilings. Austria would be very close to meeting all of its ceilings. Germany and Spain would still exceed their NH_3 ceilings.

The WM or 'with measures' projection is calculated by Member States on the basis of adopted policies and measures currently in place. For assessing attainment with the 2020 and 2030 reduction commitments, for each Member State NO_x and NMVOCs emissions from the two main agricultural activities, manure management (3B) and agricultural soils (3D), are subtracted, as required by the new NEC Directive.

Six Member States reported besides the WM projections also 'with additional measures' (WAM) scenarios that reflect adopted as well as planned measures: Germany, Croatia, Ireland, Lithuania, Romania and Slovakia. If these WAM projections are compared with the 2030 reduction commitments, results indicate that some countries consider themselves on track towards meeting their commitments for some pollutants.

Nitrogen oxides (NO_x)

Six Member States exceeded their NO_x emission ceilings in 2015. Austria, Luxembourg, Ireland and Germany exceeded their NO_x ceilings the most, in percentage terms, by 28 %, 19 %, 13% and 13 %, respectively. In absolute amounts, the largest emitters of NO_x in 2015 were Germany, the United Kingdom and Spain. Between 2014 and 2015, 20 Member States reported emission reductions for NO_x. The total reduction for the aggregated EU emissions amounts to −2.1 % between 2014 and 2015.

Non-methane volatile organic compounds (NMVOCs)

In 2015, six Member States (Denmark, Germany, Hungary, Ireland, Luxembourg and Portugal) did not attain their ceilings. The highest exceedance in 2015, in percentage terms, was reported for Ireland (84 %). This is due to the recent addition of NMVOC emissions from agriculture into the country's emission inventory. The largest emitters of NMVOCs in 2015 were Germany, Italy and United Kingdom. Between 2014 and 2015, 10 Member States reported emission reductions for NMVOCs. The aggregated EU emissions increased by just 0.5 % between 2014 and 2015.

Sulphur dioxide (SO_2)

All Member States complied with the emission ceilings for SO_2. The largest emitters of SO_2 were Poland, Germany and Spain. Between 2014 and 2015, 19 Member States reported emission reductions for SO_2. The total reduction for the aggregated EU emissions amounted to –6.1 % between 2014 and 2015.

Ammonia (NH_3)

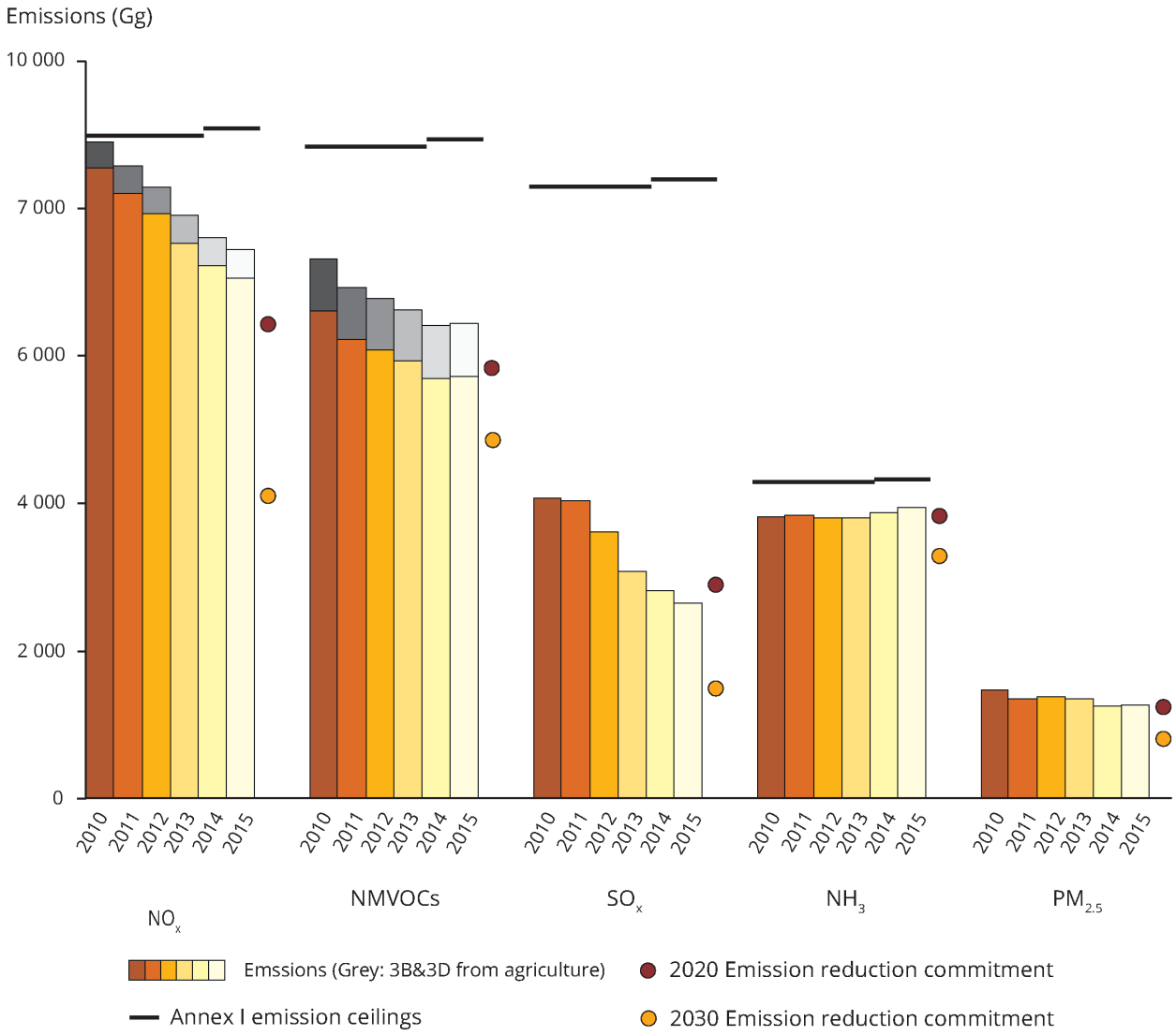
Six Member States (Austria, Denmark, Finland, Germany, Spain and Sweden) exceeded their NH_3 ceilings in 2015. The highest exceedances, in percentage terms, were reported for Germany (38 %) and Spain (34 %). The smallest exceedance was reported for Austria (1 %). The largest emitters of NH_3 were Germany, France and Spain. Between 2014 and 2015, eight EU Member States reported emission reductions for NH_3. For the second consecutive year, EU emissions of NH_3 increased, by 1.7 % between 2014 and 2015.

EU progress in meeting its emission ceilings and comparison with future emission reduction commitments

Under the new NEC Directive, the EU must until 2019 continue to meet the aggregated 2010 emission ceilings for four key pollutants, NO_x, NMVOCs, SO_2 and NH_3. In each year since 2010, the total EU emissions of these pollutants were below the respective ceilings (Figure 1). In 2015, EU total emissions of NMVOCs and SO_2 were already below the 2020 reduction commitments set for these pollutants. Only for NO_x a further, more significant, reduction is required in order to meet the 2020 commitment — emissions need to be reduced by a further 9 % compared with 2015 levels. In contrast, more substantial reductions are needed for all pollutants if the EU is to achieve its 2030 emission reduction commitments (i.e. NO_x a reduction of 42 % compared to 2015 emissions, NMVOCs 15 %, SO_2 44 %, NH_3 16.4 % and $PM_{2.5}$ 36 %).

Air pollution

Figure 1: EU progress in meeting the 2010 emission ceilings and the 2020/2030 reduction commitments



Notes:

Croatia joined the EU in mid-2013; therefore, for the years 2010-2013 emissions and ceilings are not considered for this country. Greece did not report data in 2017; therefore, the aggregated EU emissions are incomplete.

The distance to ceilings was calculated based on **unadjusted** emissions.

The 2001 NEC Directive does not include 2010 ceilings for $PM_{2.5}$. The EU's 2020 and 2030 reduction commitments are calculated relative to 2005 base year emissions.

For assessing future attainment with the 2020 and 2030 reduction commitments, NO_x and NMVOCs emissions from two main agricultural activities, manure management (3B) and agricultural soils (3D) are not considered. The magnitude of these emission sources is indicated by the top part of the NO_x and NMVOC columns. Thus only the lower part of the NO_x and NMVOCs columns should be considered for comparing with the 2020 and 2030 reduction commitments.

Reasons for exceedances of emission ceilings

NO_x emissions from road transport contribute 39 % of the EU emissions total. They are one of the main reasons for the large number of NO_x exceedances since 2010. NO_x reductions from this sector have been lower than originally anticipated over the past two decades, partly because transport has grown more than expected, and partly owing to the larger than expected growth in the number of diesel vehicles that produce higher NO_x emissions than petrol-fuelled vehicles. The high 'real-world emissions' of NO_x, particularly from diesel passenger cars and vans, have contributed significantly to the share of emissions caused by the road transport sector. The EU's annual air quality limit value for nitrogen dioxide (NO_2) is widely exceeded across Europe, and more than 90 % of the values above the annual limit value can be observed at traffic monitoring stations (EEA, 2016).

Six Member States continue to exceed their respective NH_3 ceilings. 94 % of NH_3 emissions come from agriculture, mainly from the handling of animal manure and the use of fertilisers. NH_3 emissions have decreased since 1990, but not to anywhere near the same extent as the other pollutants covered by the NEC Directive. A number of technical measures exist to reduce NH_3 emissions. A main reason for the high or even rising NH_3 emissions in some countries is an increasing number of pig or poultry facilities, without implementing measures and/or technologies to limit emissions. NH_3 emissions from agriculture contribute to the formation of $PM_{2.5}$ in the atmosphere and can contribute to high-PM episodes in Europe. NH_3 (and NO_X) emissions also contribute to an oversupply of airborne nitrogen in sensitive ecosystems, reducing for example 'species richness' in nutrient-poor grasslands (EEA, 2016).

More information

- Access the complete data set reported by Member States in the EEA's online data viewer.

References and footnotes

EEA (2016), Air quality in Europe — 2016 report, EEA Report No 28/2016, European Environment Agency.

EU (2016), Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC (OJ L 344, 17.12.2016, p. 1-31).

[1] Croatia joined the EU in mid-2013; therefore, for the years 2010-2013 emissions and ceilings are not considered for this country. Greece did not report data in 2017; therefore, the aggregated EU emissions are incomplete.

[2] The 2010 emission ceilings are set in the 'old' National Emissions Ceilings Directive, Directive (EC) 2001/81

[3] Only 24 Member States reported projections for the main air pollutants. France, Greece, Latvia, and Malta did not submit information on projections as is required under the new NEC Directive.

Identifiers

Briefing no. 5/2017

Title: NEC Directive reporting status 2017 - The need to reduce air pollution in Europe

Linguistic version	Media/Volume	Catalogue number	ISBN	ISSN	DOI
EN	PDF/Volume_01	TH-AM-17-005-EN-N	978-92-9213-867-7	2467-3196	10.2800/059824
	HTML/Volume_01	TH-AM-17-005-EN-Q	978-92-9213-868-4	2467-3196	10.2800/10905
	ePUB/Volume_01	TH-AM-17-005-EN-E	978-92-9213-884-4	2467-3196	10.2800/879843

Published on 03 Jul 2017