

National Emission Ceilings (NEC) Directive

NEC Directive reporting status 2018



Air pollution is a key environmental and social issue, the management and mitigation of which pose multiple challenges. It is the single largest environmental risk to human health in Europe, causing respiratory problems and shortening lifespans. Air pollution also affects ecosystems through, for example, the eutrophication of sensitive areas and the effect of ozone on vegetation. In addition, air pollution has negative impacts on the built environment and several atmospheric pollutants contribute to climate change (EEA, 2017).

This briefing presents progress made by the EU ([1]) and its Member States in meeting the 2010 emission ceilings that remain applicable until the end of 2019 under the new National Emission Ceilings (NEC) Directive ((EU) 2016/2284; EU, 2016). The analysis is based on the latest air pollutant emission inventory data for the period 2010-2016 as reported by Member States in February 2018. The briefing also provides an assessment of the projected emissions for 2020 and 2030 as reported by Member States ([2]) in relation to their individual reduction commitments set in the new directive for these years.

Key messages

- In 2016, the total emissions of four important air pollutants — nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOCs), sulphur dioxide (SO₂) and ammonia (NH₃) — were below the respective 2010 ceilings set for the EU as a whole.
- While emissions of these air pollutants have decreased in the EU since 2010, for the third consecutive year, emissions of NH₃ increased by 0.5 % across the EU from 2015 to 2016. Over the period 2014-2016, the overall increase was about 2.0 %. These increases are mainly because of higher emissions from the agriculture sector.
- In 2016, six Member States continued to exceed their NEC Directive national ceilings for one or more pollutants.
- Two Member States, Austria and Ireland, exceeded two ceilings in 2016, namely for NO_x and NH₃. Four Member States exceeded ceilings in 2016 for one pollutant: Croatia, Germany and Spain exceeded their ceiling for NH₃, whereas Hungary exceeded its ceiling for NMVOCs. Over the period 2010-2016, two Member States persistently exceeded their respective emission ceilings for NO_x (Austria and

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Ireland), one for NMVOCs (Hungary) and three for NH₃ (Croatia, Germany and Spain). No Member State exceeded its SO₂ ceiling.

- However, under certain circumstances, the new NEC Directive allows Member States to 'adjust' their emission inventories downwards in order to be assessed for compliance with national ceilings. In 2018, new adjustment applications were submitted by four Member States (Austria, Hungary, Ireland and the United Kingdom). In addition, nine Member States (Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Luxembourg and Spain) asked for adjustments related to applications that were already approved by the European Commission (EC) in 2017. All adjustment applications will be reviewed by the EC. If approved, the number of Member States exceeding one or more emission ceilings in 2016 would decrease from six to four, with emissions from Hungary and Ireland subsequently falling below all of their respective ceilings. Austria would achieve an emission level below its NO_x ceiling from 2014 onwards and be very close to meeting its ceiling for NH₃.

- In 2016, the aggregated EU emissions for two pollutants (NMVOCs and SO₂) were already below the respective levels of the EU's 2020 emission reduction commitment set for these pollutants. Emissions of NH₃ and fine particulate matter (PM_{2.5}) are also already very close to the respective 2020 reduction commitments (only a further reduction of around 2 % is needed in both cases). For NO_x, a further, more significant, reduction of 5 % is required at EU level 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 (more than 30 % for PM_{2.5} and SO₂ and almost 40 % for NO_x).

- Projected emissions reported by all Member States in 2017 and 2018 show that 20 of them do not consider themselves on track towards meeting their reduction commitments set for 2020 for one or several of the pollutants (NO_x, NH₃, NMVOCs, SO₂ and/or PM_{2.5}) on the basis of policies and measures currently in place. Similarly, 27 Member States are not on track for one or more of their 2030 commitments. Additional emission reduction measures clearly 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 2010 (as set in the previous 2001 NEC Directive) remain applicable until the end of 2019. After this date, new emission reduction commitments for 2020 onwards, and later for 2030 onwards, are applicable. Under the new directive, Member States report annual emission inventory information from 1990 — or 2000 in the case of PM_{2.5} — until the current year minus 2 years. Every second year, emission projections for SO₂, NO_x, NH₃, 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 by Parties under the Gothenburg Protocol of the LRTAP Convention, the new NEC Directive establishes a process that allows Member States to 'adjust' their emission inventories downwards if non-compliance with the national ceilings is caused by countries having applied improved emission inventory methods in accordance with updated scientific knowledge available since 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 each year) and subsequently submit a range of documentation (by 15 March each year) for review by the European Commission (EC). Adjustment applications for sub-sectors and pollutants that were approved by the EC in 2017 are taken into account in the present note, so that it is possible to identify whether ceilings have been attained. However, the four new adjustment applications submitted in 2018 are currently under evaluation and are not considered here. **The number of exceeded ceilings shown here for Member States is, therefore, still subject to change.**

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

Member State	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		Reported emissions vs. 2010 ceilings				WM proj. vs. reduction commitments				
	NO _x								NMVOCs								SO ₂								NH ₃								PM _{2.5}						
	2010	11	12	13	14	15	16	2020	2030	2010	11	12	13	14	15	16	2020	2030	2010	11	12	13	14	15	16	2020	2030	2010	11	12	13	14	15	16	2020	2030	2020	2030	2020
Austria	X	X	X	X	X	X	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	✓	X			
Belgium	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Bulgaria	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X				
Croatia	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X	✓	✓	✓	✓			
Cyprus	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Czech Republic	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓			
Denmark	X	X	X	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	✓	X	X	✓	X			
Estonia	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓			
Finland	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X				
France	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	X			
Germany	X	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X	X	✓	✓				
Greece	X	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X			
Hungary	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X	X	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Ireland	X	X	X	X	X	X	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	✓	✓	✓	✓	✓				
Italy	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X			
Latvia	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	X	X	✓	✓			
Lithuania	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X			
Luxembourg	X	X	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X			
Malta	X	X	X	✓	✓	✓	✓	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	✓	✓			
Netherlands	X	X	X	X	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
Poland	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓			
Portugal	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X			
Romania	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X			
Slovakia	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X			
Slovenia	X	X	X	X	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X			
Spain	X	X	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X	X	X	X	✓	✓	X			
Sweden	X	X	X	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
United Kingdom	X	✓	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	X	X	X	X		
✓	14	18	20	24	25	26	26	22	10	21	26	26	26	27	27	27	23	12	28	28	28	28	28	28	28	26	11	22	22	23	24	24	25	23	15	10	18	10	
X	14	10	8	4	3	2	2	6	18	7	2	2	2	1	1	1	5	16	0	0	0	0	0	0	0	2	17	6	6	5	4	4	3	5	13	18	8	16	

Notes:

✓ indicates that the emission ceiling or reduction commitment has been, or is anticipated to be, attained. The NEC Directive does not include a 2010 ceiling for PM2.5.

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

The comparison with current emission ceilings is calculated based mainly on adjustment applications approved by the European Commission (EC) in 2017; new adjustment applications submitted in 2018 are not taken into account in this table. All adjustment applications will be reviewed by the EC. If approved, the number of Member States exceeding one or more emission ceilings in 2016 would decrease from six to four, with emissions from Hungary and Ireland subsequently falling below all of their respective ceilings. Austria would achieve an emission level below its NO_x ceiling from 2014 onwards and be very close to meeting its ceiling for NH₃. The 'with measures' (WM) projection is calculated by Member States on the basis of adopted policies and measures currently in place. To assess attainment of 2020 and 2030 reduction commitments for each Member State, NO_x and NMVOC emissions from the two main agricultural activities (manure management (3B) and agricultural soils (3D)) are subtracted, as required by the new NEC Directive.

Besides the WM projections, eight Member States also reported 'with additional measures' (WAM) scenarios that reflect adopted and planned measures. These are Croatia, France, Germany, Ireland, Latvia, Lithuania, Romania and Slovakia.

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Nitrogen oxides (NO_x)

Two Member States exceeded their NO_x emission ceilings in 2016. Austria and Ireland exceeded them most — by 3 %, and 40 % — respectively. Both Member States submitted a new adjustment application for emissions reported under sectors 3B (manure management) and 3D (agricultural soil). In absolute amounts, the largest emitters of NO_x in 2016 were Germany followed by the United Kingdom and Spain. Between 2015 and 2016, 24 Member States reported emission reductions for NO_x. The total reduction for the aggregated EU emissions amounted to 3.4 % between 2015 and 2016.

Non-methane volatile organic compounds (NMVOCs)

In 2016, one Member State (Hungary) exceeded its ceiling by about 3 %. The largest emitter of NMVOCs in 2016 was Germany, followed by Italy and the United Kingdom. Between 2015 and 2016, 16 Member States reported emission reductions for NMVOCs. The aggregated EU emissions decreased by just 0.4 % between 2015 and 2016.

Sulphur dioxide (SO₂)

All Member States complied with the emission ceilings for SO₂. The largest emitter of SO₂ was Poland, followed by Germany and Spain. Between 2015 and 2016, 22 Member States reported emission reductions for SO₂. The total reduction for aggregated EU emissions amounted to 16 % between 2015 and 2016.

Ammonia (NH₃)

Five Member States (Austria, Croatia, Germany, Ireland and Spain) exceeded their NH₃ ceilings in 2016. The highest exceedances, in percentage terms, were reported for Spain (39 %) and Croatia (17 %). The smallest exceedances were reported for Austria and Ireland (both 1 %). The largest emitter of NH₃ was Germany, followed by France and Spain. Between 2015 and 2016, 14 EU Member States reported emission reductions for NH₃. For the third consecutive year, EU emissions of NH₃ increased: from 2015 to 2016 the increase was about 0.5 %.

Particulate Matter (PM_{2.5})

The NEC Directive does not include a 2010 ceiling for primary PM_{2.5}. The largest emitter of PM_{2.5} in 2016 was France, followed by Italy and Poland. Between 2015 and 2016, 17 Member States reported emission reductions for PM_{2.5}. EU emissions of PM_{2.5} decreased by 0.8 % between 2015 and 2016.

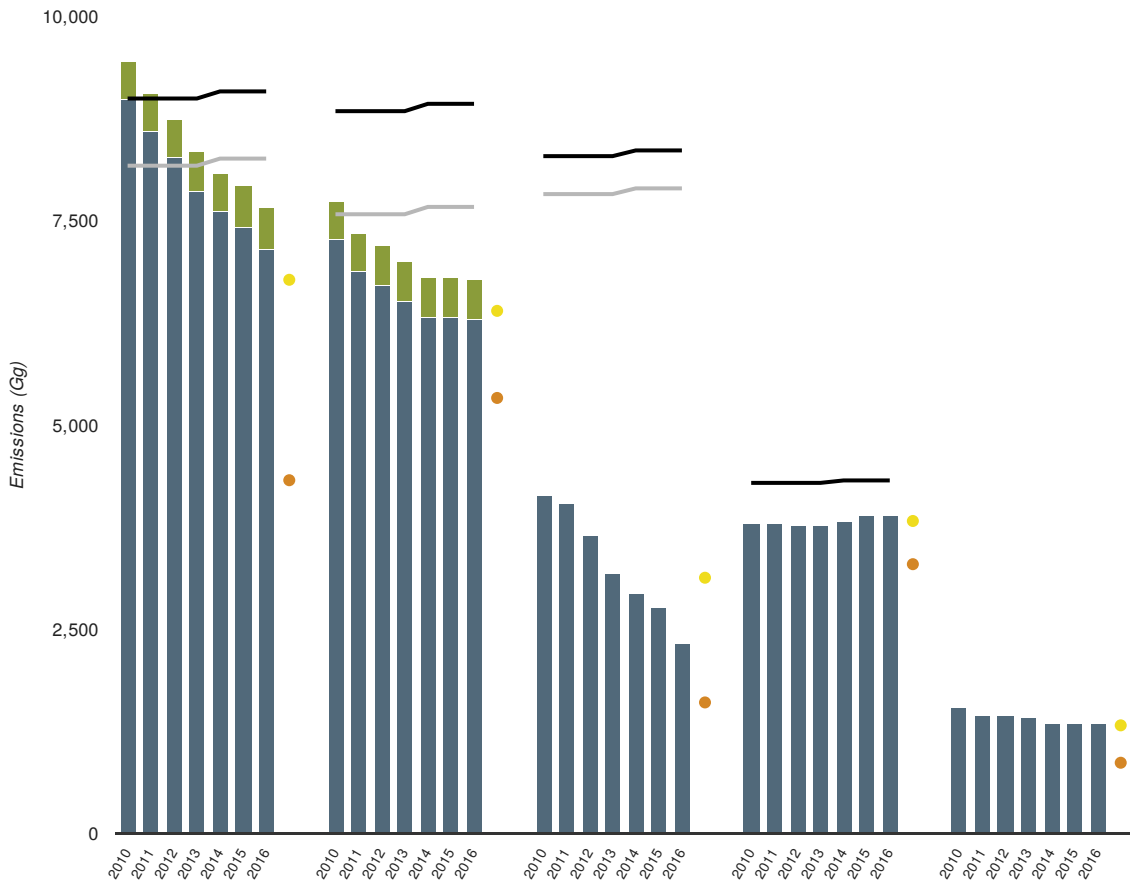
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EU progress in meeting its emission ceilings and comparison with future emission reduction commitments

Under the 2016 NEC Directive, until the end of 2019, the EU must continue to meet aggregated 2010 emission ceilings for the four key pollutants NO_x, NMVOCs, SO₂ and NH₃. In each year since 2010, total EU emissions of these pollutants were below their respective ceilings (Figure 1). In 2016, EU emissions of NMVOCs and SO₂ were already below the 2020 reduction commitments set for these pollutants. For both PM_{2.5} and NH₃, a reduction of 2 % compared with the 2016 level is required in order to meet the 2020 EU commitment, whereas, for NO_x, EU emissions need to be reduced by a further 6 % compared with 2016 levels. In contrast, additional efforts are needed for all pollutants if the EU is to achieve its 2030 emission reduction commitments (i.e. for NO_x a reduction of 40 % compared with 2016 emissions; for NMVOCs, 15 %; for SO₂, 34 %; for NH₃, 16 %; and for PM_{2.5}, 36 %).

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



NO_x
PM₁₀
NMVOC_s
SO₂
NH₃

- 2030 emission reduction commitment
- 2020 emission reduction commitment
- Annex II emission ceilings
- Annex I emission ceilings
- Emissions (green bars signify manure management (3B) and agricultural soil (3D) from agriculture)
- Emissions

[Explore chart interactively](#)



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Notes:

Croatia joined the EU in mid-2013, so for the years 2010-2013, emissions and ceilings are not considered for this country.

The distance to ceilings was calculated taking into account information from adjustment applications approved by the European Commission in 2017 and reintroduced by Member States in 2018. The four new adjustment applications are not considered. The attainment of the ceiling might change after the adjustment review process.

The 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.

To assess future attainment of 2020 and 2030 reduction commitments, NO_x and NMVOC 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 green bars on top of the NO_x and NMVOC columns. Thus, only the lower part of the NO_x and NMVOC columns should be considered for comparison with the 2020 and 2030 reduction commitments.

Additional efforts are needed on the path towards 2020 and 2030

According to the 2016 NEC Directive, the reporting and assessment of reliable emission projections are key priorities to facilitate the design of effective National Air Pollution Control Programmes (NAPCP). These should be submitted by 1 April 2019. Such programmes are essential for attaining the 2020 and 2030 emission reduction commitments. In 2017, all Member States reported their projections for the five main air pollutants. Three countries (Finland, Luxembourg and the United Kingdom) submitted updated information in 2018. As stated above, additional efforts are required across all Member States in order to be in a position to meet agreed emission reduction commitments.

Focusing on 2020, the greatest effort will involve emission reductions of ammonia: thirteen EU Member States (Austria, Denmark, Estonia, France, Germany, Greece, Ireland, Latvia, Luxembourg, Malta, Spain, Sweden and the United Kingdom) reported projected emissions above their agreed commitments. Eight EU Member States reported projected emissions above their commitments for PM_{2.5} (Bulgaria, Finland, Greece, Lithuania, Luxembourg, Slovakia, Slovenia and the United Kingdom). Six Member States reported emissions of NO_x above their agreed commitments (Cyprus, Hungary, Latvia, Lithuania, Luxembourg and Slovenia), whereas five are above their NMVOCs commitment (Bulgaria, Greece, Hungary, Lithuania and Poland). Only Hungary and Lithuania are not on track to meet their commitment for SO₂ emissions.

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To attain their 2030 emission reduction commitments, further efforts are needed from many EU Member States. As clearly shown in Table 1, over a half of Member States reported projections indicating that they are not on track to meet their commitments for all five pollutants.

The above overview of future emission projections may change substantially in the coming period as Member States update their projections to inform the development of their NAPCPs, which are due in 2019.

More information

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

References and footnotes

[1] Croatia joined the EU in mid-2013, so for the years 2010-2013, Croatia's emissions and ceilings are not considered.

[2] Since 2017, all Member States have reported projections for the main air pollutants. Some Member States did re-submit projection data in 2018.

EEA, 2017, Air quality in Europe — 2017 report, EEA Report No 13/2017, 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).

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