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REPORT FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT AND THE COUNCIL

on the progress made on the implementation of Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants

1. Introduction

Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants is the main legislative instrument to achieve the 2030 objectives of the Clean Air Programme[1]. This directive – referred to also as the NEC Directive – sets national emission reduction commitments for each EU Member State for the period 2020 to 2029 and more ambitious ones as of 2030, targeting five air pollutants responsible for significant negative impacts on human health and the environment: sulphur dioxide (SO_2), nitrogen oxides (NO_x), non-methane volatile organic compounds (NMVOC), ammonia (NH_3) and fine particulate matter ($PM_{2.5}$). The aim established in the Clean Air Programme, is to reduce the health impacts of air pollution by half by 2030 compared to 2005.

The Directive entered into force on 31 December 2016, repealing Directive 2001/81/EC[2] on national emission ceilings for certain atmospheric pollutants, with effect from 1 July 2018. Under Directive (EU) 2016/2284, $PM_{2.5}$ is added to the pollutants for which mandatory reductions have been set, and the list of pollutants for which reporting is obligatory is expanded. The Directive also introduces a shift from emission ceilings, which prescribe a fixed maximum annual amount of emissions in kilo tonnes per pollutant, to emission reduction commitments, which set reduction obligations expressed as a percentage of the emissions of each pollutant in the baseline year 2005. To ensure continuity in improving air quality, Directive (EU) 2016/2284 stipulates that the national emission ceilings set in Directive 2001/81/EC as from 2010 continue to apply until 31 December 2019. An overview of the extent to which Member States meet their respective emission ceilings is available on the European Environment Agency website.[3]

The emission reduction commitments for 2020 to 2029 under Directive (EU) 2016/2284 correspond to the emission reduction commitments for 2020 and onwards taken by the EU and its Member States under the revised Gothenburg Protocol[4] to the UNECE Convention on Long-Range Transboundary Air Pollution[5]. The Directive thereby transposes those international obligations.

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[1] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, A Clean Air Programme for Europe, COM (2013)918, 18.12.2013

[2] Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants, OJ L 309, 27.11.2001, p. 22.

[3] Further detail on the EU and its Member States meeting the 2010 emission ceilings is available at: https://www.eea.europa.eu/themes/air/air-pollution-sources-1/national-emission-ceilings/nec-directive-reporting-status-2019

[4] 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to the Convention on Lang-range Transboundary Air Pollution, as amended on 4 May 2012 (amended Gothenburg Protocol) http://www.unece.org/env/lrtap/status/lrtap_s.html

[5] 1979 Convention on Long-Range Transboundary Air Pollution https://www.unece.org/environmental-policy/conventions/envlrtapwelcome/the-air-convention-and-its-protocols/the-convention-and-its-achievements.html

Directive (EU) 2016/2284 which addresses overall national emissions is part of an EU legal framework on clean air alongside with the EU Ambient Air Quality Directives[6] and EU legislation regulating air pollution at source[7]. Effective implementation of clean air legislation forms an essential contribution to 'a zero pollution ambition for a toxic-free environment' announced by the Commission in the European Green Deal on 11 December 2019 and related initiatives, such as the 'zero pollution action plan for water, air and soil' planned for 2021.[8]

Member States were required to fully transpose Directive (EU) 2016/2284 into national law by 1 July 2018. Late communication of transposition was followed up on by the Commission through letters of formal notice according to Article 258 TFEU in five cases. Meanwhile, all Member States have communicated transposition and the Commission is in the process of checking the conformity of the notified national measures, including with a view to initiating infringement procedures where national legislation is not in line with the requirements of the Directive.

According to Article 11(1) of Directive (EU) 2016/2284, the European Commission has an obligation to inform the European Parliament and the Council on the progress made in the implementation of the Directive. This report presents achievements to date in contributing to the attainment of national emission reduction commitments, improving air quality and impacting human health and the environment[9].

Since certain impacts of the implementation of the Directive will become apparent only over a longer period of time and require multiannual datasets for their assessment, the extent to which this report addresses the different items enumerated under Article 11(1) of the Directive varies. In particular, as regards emission reduction commitments as from 2020, Member States will only report emission data to the Commission in 2022. Consequently, this report presents the results of analysing projected emissions in this respect. Similarly, the capacity to report on health and ecosystems impacts of emissions reductions set by the Directive is limited at this stage. The report puts a focus on the National Air Pollution Control Programmes (NAPCPs) Member States were required to submit by 1 April 2019. NAPCPs constitute a central governance instrument in attaining the national emission reduction commitments and are therefore particularly useful in providing

[6] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe (OJ L 152, 11.6.2008) and Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (OJ L 23, 26.1.2005)
[7] An overview is available at: https://ec.europa.eu/environment/air/index_en.htm
[8] COM(2019) 640 final
[9] Since this report covers implementation of the Directive until beginning of 2020, the United Kingdom is fully included in the analysis.

an initial assessment of the extent to which Member States are on track to compliance or whether efforts would need to be accelerated.

The second Clean Air Outlook, planned for end of 2020 and following up on the initial Clean Air Outlook published in 2018[10], will complement this report and the Commission analysis as regards the trajectory to compliance. More specifically, the 2020 Clean Air Outlook will provide a detailed analytical assessment of the extent to which Member States and the EU as a whole are on track to meet the Directive's emission reductions requirements and to improve air quality, health as well as the environment, and of the costs and benefits of the needed measures and expected impacts.

2. Projected achievement of the emission reduction commitments

2.1. Emissions inventories and projections as a basis for compliance checking

The central obligation for Member States established under Directive (EU) 2016/2284 are the emission reduction commitments for the air pollutants SO_2, NO_x, NMVOC, NH_3 and $PM_{2.5}$ for the years 2020 to 2029 and from 2030 onwards. The Member States report emission inventories every year in February, as per Article 10(2) of the Directive. These inventories are used to check compliance with the emission reduction commitments. However, there is a two-year time lag between the actual emissions and the inventories reporting. The latest inventories reported in February 2020 pertain to emissions from 2018. It is therefore not yet possible to check compliance with the 2020 emission reduction commitments. However, Member States also have the obligation pursuant to Article 10(2) to report every two years their projected emissions, with the latest reporting having taken place in 2019. Projected emission levels are compared to reduction commitments for 2020-29 and 2030 onwards to assess projected compliance.

Good quality of inventories and of projections is paramount for a reliable assessment of compliance. The Commission monitors closely the improvements in the quality of inventories and projections and supports Member States in this endeavour (see section 5.1 of this report), including by conducting and publishing reviews of inventories[11] and projections[12] and providing capacity building.

The inventory reviews assess not only the quality of the inventory data but also the acceptability of inventory adjustment applications submitted by Member States in accordance with Article 5 of the Directive. Under certain conditions defined in the

[10] COM(2018) 446 final
[11] See https://ec.europa.eu/environment/air/reduction/implementation.htm
[12] See https://ec.europa.eu/environment/air/reduction/NAPCP.htm

Directive and in case of non-compliance, Member States may adjust their inventories downward. According to Article 5(1) of the Directive, Member States can establish adjusted inventories to take account of developments in inventory methods updated in accordance with scientific knowledge since the emission reduction commitments were first established. Article 21(2) of the Directive allows the Member States to apply Article 5(1) in relation to the ceilings established under the National Emission Ceilings Directive (Directive 2001/81/EC). After about a third of Member States applied for adjustments in 2017, a more limited number of Member States applied for new adjustments in 2018, 2019 and 2020.[13]

The projections reported in 2019 were assessed together with the NAPCPs[14], as projections are the basis for assessing the potential risk of non-compliance and therefore the need for new measures. Five quality assessment criteria for projections are set in Annex IV, Part 2 to the Directive: transparency, consistency, comparability, completeness and accuracy. Lack of transparency has been identified in the latest review as the main shortcoming, with a majority of Member States (18)[15] failing to provide sufficient detail on the methodologies, input datasets and assumptions used for preparing their projections. Comparability and completeness of projections were in general good, while overall accuracy was deemed insufficient in ten Member States[16]. In most cases, this was due to the use of overly simplified methodologies and insufficient detail in input data for key sectors of emissions.

2.2. Projected achievement of the 2020-29 and 2030 onward emission reduction commitments

Article 10(2) of Directive (EU) 2016/2284 requires Member States to report projections of air pollutant emissions for the years 2020, 2025 and 2030[17], to assess the extent to which Member States are on track to meet their emission reduction commitments for 2020 to 2029, and for 2030 onwards, respectively. These also are the basis for assessing whether emissions follow a linear trajectory between 2020 and 2030 (if otherwise, this needs to be justified). Projections shall cover a "With Measures" scenario (existing measures only) and, where relevant, a "With Additional Measures" scenario (existing measures and planned additional

[13] https://ec.europa.eu/environment/air/reduction/implementation.htm: Nine Member States applied for the first time for adjustment in 2017.In 2018 four Member States and in 2019 and 2020 one Member State applied for new adjustments, (while the previous adjustment applications were re-submitted).
[14] See full assessment at : https://ec.europa.eu/environment/air/reduction/NAPCP.htm
[15] Belgium, Estonia, Ireland, Greece, Spain, Croatia, Italy, Cyprus, Lithuania, Luxembourg, Hungary, Netherlands, Poland, Portugal, Romania, Slovenia, Slovakia, and Sweden
[16] Bulgaria, Greece, Croatia, Italy, Latvia, Luxembourg, Hungary, Poland, Portugal and Romania
[17] Article 10(2) refers to Annex I Table C of Directive (EU) 2016/2284 which details the reporting requirements as regards emissions and projections

measures)[18]. If a Member State projects to meet all its emission reduction commitments under existing measures, then the "With Measures" scenario will suffice.

Under the "With Measures" scenario, analysis shows that ten Member States[19] project to fulfil *all* 2020 emission reduction commitments, while the number falls to four[20] when it comes to the 2030 commitments (see Annex 1 to this report). All Member States not reaching their emission reduction commitments with existing measures need to put in place additional measures. However, nine Member States that project non-compliance with one or more emission reduction commitments in their "With Measures" scenario did not report a "With Additional Measures" scenario[21]. In parallel, among the seventeen Member States that reported a "With Additional Measures" scenario[22], only seven[23] project compliance for all emission reduction commitments (all years and all pollutants). The other Member States will need to put in place additional measures in order to fulfil their emission reduction commitments.

For both "With Measures" and "With Additional Measures" scenarios, non-compliance is most frequently projected for NH_3 emission reduction commitments (both for 2020-2029 and 2030 onwards), followed by NMVOC, NO_x and $PM_{2.5}$. Except for a few specific cases, meeting the SO_2 emission reduction commitments does not currently appear to be an issue across the EU.

3. Analysis of the NAPCPs

3.1. Fulfilment of legal requirements

Article 6(1) of Directive (EU) 2016/2284 requires Member States to adopt a National Air Pollution Control Programme (NAPCP) to show how they intend to limit their annual anthropogenic emissions in view of their emission reduction commitments. The NAPCP constitutes a central governance instrument that allows Member States to coordinate and agree their policies and measures (PaMs) to ensure national emission reduction commitments are met. Its preparation requires consultation and involvement of competent authorities at different levels and of several different sectors, such as environment, agriculture, energy, climate, transport, industry or finance. A particular emphasis is put on coherence with plans

[18] Article 8(5) of Directive (EU) 2016/2284 Directive refers to its Annex IV Part 2 which details requirements for projections.
[19] Belgium, Czechia, , Greece, Spain, Croatia, Cyprus, Netherlands, Portugal, Slovakia and Finland
[20] Croatia, Cyprus, Netherlands, Finland
[21] Italy, Luxembourg, Hungary, Austria, Poland, Portugal, Slovenia, Sweden and the United Kingdom
[22] See Annex 2
[23] Belgium, Bulgaria, Czechia, Greece, France, Croatia, Netherlands

and programmes under all relevant policy areas. Furthermore, the NAPCP is a tool to communicate a Member State's pollution control policies and to involve the public in the process of policy-making.

In accordance with Article 6(10) of the Directive, the Commission has specified the format of the NAPCP in Commission Implementing Decision (EU) 2018/1522[24] setting out mandatory and optional content, based on Article 6 and Annex III Part 1 to the Directive. The additional PaMs selected for adoption by Member States to further reduce emissions constitute an essential part of that mandatory content. These additional PaMs have to be reported via the 'EEA-PaM Tool', a web-tool developed by the European Environment Agency (EEA). The Commission has also prepared guidance for the development of NAPCPs[25], in accordance with Article 6(9) of the Directive. The guidance supports Member States in drawing up an NAPCP in line with the format and in compliance with the requirements of the Directive. The first NAPCPs were due by 1 April 2019. NAPCPs must be updated at least every four years and earlier if new data so requires.

Eight Member States[26] submitted their final NAPCPs to the Commission on time. A further sixteen Member States[27] submitted their final NAPCPs by May 2020[28], while two Member States[29] submitted only draft NAPCPs by the same date. Two Member States[30] have not yet submitted a draft NAPCP nor a final NAPCP. In February this year, the Commission initiated infringement procedures against the three Member States[31] that had not yet submitted any NAPCP at the time, one out of which subsequently submitted its NAPCP in March[32]. Member States frequently attributed delays in reporting to lengthy consultation procedures and the need to align the NAPCP with the National Energy and Climate Plan due by 31 December 2019 under Regulation (EU) 2018/1999[33] on the governance of the energy union and climate action.

[24] Commission Implementing Decision (EU) 2018/1522 of 11 October 2018 laying down a common format for national air pollution control programmes under Directive (EU) 2016/2284 of the European Parliament and of the Council on the reduction of national emissions of certain atmospheric pollutants, OJ L 256, 12.10.2018, p. 87.
[25] Communication from the Commission on Guidance for the development of National Air Pollution Control Programmes under Directive (EU) 2016/2284 of the European Parliament and the Council on the reduction of national emissions of certain atmospheric pollutants, OJ C 77, 1.3.2019, p. 1.
[26] Belgium, Denmark, Estonia, Netherlands, Portugal, Finland, Sweden, United Kingdom
[27] Bulgaria, Czechia, Germany, Ireland, Spain, France, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Austria, Poland, Slovenia, Slovakia
[28] Cut-off date for inclusion into this report
[29] Italy, Luxembourg
[30] Greece, Romania
[31] Greece, Malta, Romania
[32] Malta
[33] Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the

As for the final NAPCPs received by the Commission by May 2020, the common format for the NAPCP was used by thirteen Member States[34], partially used by nine Member States[35] and not used by two Member States[36].

Pursuant to Article 6(5) of Directive (EU) 2016/2284 Member States had to consult the public in accordance with Directive 2003/35/EC[37] on the draft NAPCP. Nineteen Member States[38] provided a link to the public consultation in their final NAPCP while five Member States[39] did not do so.

As regards the reporting of mandatory content of the NAPCP, the majority of the documents analysed fully provided the mandatory content or did so with only relatively minor gaps[40], but there is a general lack of detail on additional policies and measures, rendering an in-depth analysis more difficult. Gaps and lack of detail were more commonly found where Member States did not use the common format or did not report via a the EEA-PaM Tool presented earlier in this report. Most Member States provided only little information about optional content (see section 4 for more details).

3.2. Analysis of reported additional policies and measures

Member States which do not project to achieve their emission reduction commitments with current policies have to report in their NAPCPs the additional policies and measures that they considered for adoption and those actually selected in order to fulfil their commitments. This reporting had to be done via the 'EEA PaM Tool'.

The extent and degree of detail of the Member States' reporting on this aspect vary across Member States and across PaMs[41]. However, the following broad trends can be identified[42]:

European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council, OJ L 328, 21.12.2018, p. 1.

[34] Belgium, Bulgaria, France, Croatia, Cyprus, Finland, Latvia, Lithuania, Hungary, Netherlands, Poland, Portugal, United Kingdom

[35] Denmark, Germany, Spain, Ireland, Malta, Austria, Slovenia, Slovakia, Sweden

[36] Czechia, Estonia

[37] Directive 2003/35/EC of the European Parliament and of the Council of 26 May 2003 providing for public participation in respect of the drawing up of certain plans and programmes relating to the environment, OJ L 156, 25.6.2003, p. 17.

[38] Belgium, Bulgaria, Denmark, Germany, Estonia, Ireland, Spain, France, Croatia, Latvia, Lithuania, Hungary, Malta, Netherlands, Austria, Poland, Finland, Sweden, United Kingdom

[39] Czechia, Cyprus, Portugal, Slovenia, Slovakia

[40] Belgium, Denmark, Germany, Estonia, Ireland, Spain, Croatia, Cyprus, Latvia, Lithuania, Hungary, Malta, Netherlands, Austria, Poland, Slovenia, Slovakia, Finland, Sweden, United Kingdom

[41] Latvia and Hungaryare not considered in the PaM analysis due to the late date of submission of their final NAPCP.

- The PaMs selected for adoption presented in the NAPCPs target the main pollutants in each sector to which they apply. High numbers of PaMs are reported in agriculture (targeting NH_3), road transport and commercial, institutional and household sectors ($PM_{2.5}$ and NO_x) and energy production and distribution ($PM_{2.5}$, SO_2 and NO_x). NO_x and $PM_{2.5}$ are the pollutants targeted by the largest number of PaMs. It should however be kept in mind that the number of PaMs does not necessarily relate linearly to effectiveness in emissions reductions.
- The PaMs range from very specific ones (e.g. restricting operation in a given plant) to very general ones (e.g. promoting energy efficiency or transport strategies), the latter leading necessarily to more uncertainty in projected emissions reductions.
- Quantified emission reductions are provided for only a small proportion of the PaMs (depending on the sectors, but always less than for half of the PaMs), which leads to uncertainty regarding the credibility of the measures and the extent to which they can contribute to meeting national emission reduction commitments. The NAPCPs also provide insufficient information to allow for comparisons of expected reductions across Member States (which would contribute to validating the estimates). When quantified emissions reductions are provided, they often increase over time, which likely corresponds to a gradual uptake of the measures.
- In certain sectors (e.g. transport, energy consumption), about half of the PaMs reported actually relate to already existing measures (or at least already adopted ones), with a reported adoption date ranging from 2004 to 2019. Several PaMs relate to existing EU legislation (e.g. implementation of Best Available Techniques under the Industrial Emissions Directive[43]) and thus belong in the "With Measures" scenario rather than in the "With Additional Measures" scenario. A clearer distinction between existing and new PaMs will allow for a better assessment of the actual need for and value added of new PaMs.
- For the agricultural sector, the PaMs correspond to the measures described in Annex III, Part 2 of the Directive (only one Member State presents a PaM beyond the ones listed in Annex III) with, overall, consistent projected emission reductions across Member States. Agriculture is the largest ammonia-emitting sector and the PaMs in this sector rightly target this pollutant; however, they are often insufficient to ensure fulfilment of the emission reduction commitments. Some agricultural PaMs provide for $PM_{2.5}$ emission reductions as a co-benefit of reducing ammonia emissions.

Overall, there is insufficient information provided in the NAPCPs about the PaMs to confidently confirm their credibility; information is in particular lacking as regards the projected uptake of the PaMs, their implementation timescale and the level of emissions reductions foreseen. In addition, for about a third of the Member

[42] More extensive information is available at https://ec.europa.eu/environment/air/reduction/NAPCP.htm

[43] Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions, OJ L 334, 17.12.2010, p. 17.

States analysed, there are some important inconsistencies between the projections reported under Article 10(2) of the Directive and the projections used in the NAPCPs, hence raising questions as to whether measures proposed in the NAPCPs are adequate.

3.3. Links between NAPCPs and National Energy and Climate Plans (NECPs)[44]

Links between air and climate/energy policies are multiple, as emitting sources of greenhouse gases and air pollutants are often the same. Therefore, in many cases, one measure can benefit reaching both air and climate goals (e.g. development of active transport modes, better insulation of buildings to reduce energy consumption). However, in some cases, also trade-offs exist (e.g. the use of bioenergy for domestic heating). Air and energy/climate legislation refer to each other and require links to be established between the NAPCPs and the NECPs[45]. The Commission guidance on the development of NAPCPs specifically invites Member States, when drafting their NAPCP, to consider the policies and measures planned under climate and energy obligations.

It is acknowledged that, due to the sequencing of legal deadlines, NAPCPs submitted on time could only refer to draft NECPs and not to the final ones. On the other hand, the air/climate-energy links should be reflected in the final NECPs, as 26 Member States[46] received in June 2019, in the context of the Energy Union governance Regulation, a Commission recommendation on their draft NECPs to improve the assessment of the air impacts.

In the NAPCPs analysed for this report, climate and energy policies are referred to, but the extent to which this actually contributed to maximising synergies and addressing trade-offs between the two policy areas is uncertain, due to the lack of details provided. The situation is also quite different across the NAPCPs concerned. Some reflect, or even quantify, the impacts on air pollution of the climate and energy measures and, reversely, assess the impacts of the air measures on greenhouse emissions. In others, the climate-energy measures are included in the list of measures listed in the NAPCP. Finally, others also use a common dataset for modelling the two policy areas.

[44] According to Article 3 of Regulation (EU) 2018/1999 Member States were required to notify their national energy and climate plans to the Commission by 31 December 2019.
[45] See, Directive (EU) 2016/2284 Article 1 (synergies); Annex III, Part 1 (consistency in priorities); Annex IV, Part 2 (consistency in projections). In parallel, see Regulation (EU) 2018/1999, Annex I, Section A, Paragraph 5(1)(i) which requires reporting projected impacts of the planned policies and measures on the emissions of the air pollutants regulated under Directive (EU) 2018/2284
[46] All Member States but Spain and France, see https://ec.europa.eu/energy/topics/energy-strategy/national-energy-climate-plans_en

The analysis of the NAPCPs indicates that there is, however, scope to enhance the links between clean air and climate and energy policies, and that further integration is needed between the two planning exercises, to increase the effectiveness of the underlying policies. The Commission will seek more such integration in the future in line with the objectives of the European Green Deal.

3.4. Risk of non-compliance with emission reduction commitments

Beyond the analysis of the projected achievement of the emission reduction commitments that each Member State has reported according to Article 10(2) of the Directive, the Commission undertook an assessment of the risk of non-compliance with the emission reduction commitments, based on the joint analysis of the quality of projections, the credibility of the PaMs selected for adoption in the NAPCPs, and the projected margin of compliance[47]. This assessment concluded that, for 2020-29 emission reduction commitments, out of twenty Member States considered in the analysis[48], fourteen[49] would be at high-risk of non-compliance with emission reduction commitments for ammonia (see Annex 3).

As regards the 2030 commitments, the picture gives even more reason for concern with more than half of the Member States analysed being at high risk of non-compliance with emission reduction commitments for all Directive (EU) 2016/2284 pollutants except SO_2. Further measures, additional to the ones presented in the NAPCPs, should therefore be put in place in these Member States in order to reduce such risk. This may involve, among others, selecting further PaMs for adoption, re-designing PaMs already selected for adoption, putting in place measures supporting implementation of the PaMs, and selecting indicators to better monitor progress with implementation. Member States will have to document these additional measures in an updated NAPCP, as required by Article 6(4) of the Directive.

[47] For full assessment, see https://ec.europa.eu/environment/air/reduction/NAPCP.htm

[48] Only 20 Member States submitted their NAPCPs and projections in time for analysis of their risk of non-compliance in this report: Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Spain, Croatia, Cyprus, Ireland, France, Lithuania, Netherlands, Austria, Poland, Portugal, Slovenia, Finland, Sweden, United Kingdom

[49] Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, France, Netherlands, Austria, Poland, Portugal, Finland, Sweden, United Kingdom

4. Analysis of the impacts of the projected emission reductions

4.1. Impacts on air quality

Reductions of pollutant emissions lead to reductions in pollutant concentrations and therefore improvements in air quality levels. Among the sixteen NAPCPs submitted in time to be analysed for this section, ten Member States (as outlined below) responded to the optional requirement to report information on the projected impacts on air quality of their additional Policies and Measures. This information varied from a qualitative description of impacts[50] to a detailed modelling of future concentrations[51] and provision of projected compliance with air quality limit values[52]. Where modelling of future changes in air quality has been conducted, Member States commonly included in their NAPCPs maps of future ambient air pollutant concentrations. This type of analysis could be usefully carried out by additional Member States in order to increase synergies between the Directive (EU) 2016/2284 and the Ambient Air Quality Directives. Such an integrative analysis would make it possible to select emission reduction measures that would improve local levels of air pollutant concentrations. The main benefits are expected to come from measures put in place in the transport and domestic heating sectors as these would apply to urban areas, with higher population exposure. Generally, all Member States have stated that impacts on air quality have been taken into account when selecting PaMs for adoption, but no PaM was selected to primarily address air quality objectives.

4.2. Impacts on ecosystems

Air pollution not only leads to human health impacts but also to acidification, eutrophication and formation of ground-level ozone, all of which are detrimental to ecosystems (freshwater or terrestrial ecosystems, semi-natural as well as agricultural ones) and to biodiversity. The Directive (Articles 9 and 10(4)) requires Member States to report these ecosystems impacts every four years starting from 1 July 2019, based on a representative network of sites which had to be put in place by 1 July 2018, and for which reporting also has to be updated every four years. All Member States satisfied these two reporting obligations. This provides the first basis for establishing a reference against which future ecosystem data reported under the Directive will be compared, contributing to the future assessment of the effectiveness of the Directive in protecting the environment over a longer period.

[50] Denmark, Croatia, Lithuania, Austria, Slovenia
[51] Belgium, Germany, Estonia, Spain, Poland
[52] Spain, Lithuania

A Commission Notice[53] and an optional reporting template together with its accompanying guide[54] were published by the European Commission in order to facilitate Member State reporting of ecosystems impacts and subsequent analysis. All Member States used the standardised reporting template for at least a portion of their 2019 data submission. The Directive also provides in its Annex V a list of optional indicators for the monitoring. Member States mostly reported those related to rivers and lakes ecosystem.

Overall, the Commission assessment shows that the current network of sites and the reported data are not yet sufficiently representative and adequate to monitor the effect of air pollution on the European ecosystems. In order to obtain useful information, it is important that the monitoring network and reported data are representative of all ecosystems on the EU territory. The analysis of the monitoring sites reported in 2018 shows that this is not always the case. Some ecosystems especially sensitive to air pollution (heathlands, bogs and acid-sensitive grasslands) are under-represented, even in Member States where these ecosystems are widespread. The data reported in 2019 confirms the above analysis, since it shows different levels of monitoring intensity among different types of ecosystems and further confirms the insufficient representation of ecosystems particularly sensitive to air pollution. However, in most Member States, various levels of exposure to different pressures are monitored through sites located in both low and high sulphur and nitrogen deposition areas, thus providing a positive contribution to the representativeness of the reported data.

The Directive aims at limiting the administrative burden of ecosystem monitoring requirements by encouraging the use of the same sites and / or data as reported under other EU or international obligations. This opportunity has been used by Member States in many cases[55].

The first ecosystems data reporting in 2019 under Directive (EU) 2016/2284 will contribute to the establishment of a reference against which future impacts can be compared, provided there is consistency over time in the reporting sites, indicators and an appropriate frequency of the monitoring. This will also allow the ecosystem impacts monitoring under the Directive to inform the Biodiversity Strategy to 2030 and beyond.

Even though the template for the NAPCPs specifies that Member States should report (as optional content) the impacts on the environment of the "With Additional

[53] Commission Notice on ecosystem monitoring under Article 9 and Annex V of Directive (EU) 2016/2284 of the European Parliament and of the Council on the reduction of national emissions of certain atmospheric pollutants (NEC-Directive), OJ C 92, 11.3.2019

[54] https://ec.europa.eu/environment/air/reduction/ecosysmonitoring.htm

[55] The other networks most commonly used by Member States for the ecosystem reporting under Directive (EU) 2016/2284 relate to the Habitats Directive, the Water Framework Directive and the International Cooperative Programmes under the Air Convention.

Measures" projection scenario, those were not reported in any of the NAPCPs submitted in 2019. Member States are more likely to report these impacts in their next NAPCP, based on the information gathered under the obligations according to Article 9 of the Directive.

4.3. Costs and benefits induced by reduced air pollutants emissions

Information on the costs and benefits of policies and measures selected for adoption by Member States is an optional content of the NAPCP format. Among the sixteen NAPCPs analysed in this regard for this report, only five[56] reported such information. Even in these NAPCPs, the costs were reported only for a few policies and measures, with a relatively low (or no) level of detail about the extent and magnitude of the measures. There was no information on the timeframe to which cost estimates apply. This very limited reporting on the costs of the proposed measures can raise doubt on the extent to which the funding for their implementation is secured. While cost estimates depend largely on national circumstances, their reporting would provide elements for a useful analysis of the relative efficiency of various measures, which could inform future policy choices in the given Member State or in others (peer learning).

None of the NAPCPs provided estimates of the monetary value of the benefits of the measures put forward. This follows from the fact that air emissions and air quality impacts of the measures are not always quantified, therefore impairing the final valuation steps.

In the next NAPCP reporting, Member States are expected to report more information on the costs and benefits of the air pollutants emission reduction measures, as this is a key element to learn from when developing future measures. In the meantime, this aspect will be analysed in the forthcoming Clean Air Outlook, through a modelling methodology.

5. Other aspects of the implementation of Directive (EU) 2016/2284

5.1. Existing EU actions supporting the implementation

In line with Article 12 of Directive (EU) 2016/2284, the Commission has to set up, at regular intervals, a European Clean Air Forum to facilitate the coordinated implementation of Union air quality legislation and policies. The Commission has organised, in cooperation with the respective Member States, two European Clean Air Fora so far. The first took place in Paris on 16-17 November 2017, and the

[56] Denmark, Estonia, Croatia, Cyprus and Sweden

second in Bratislava on 28-29 November 2019.[57] Both events were met with strong interest from stakeholders from government, industry, non-governmental organisations and citizens. The Clean Air Forum 2017 focused on the themes of air quality in cities, air pollution from the agricultural sector, as well as clean air business opportunities. The Clean Air Forum 2019 followed up on the discussion on agricultural impacts on air pollution and in addition put an emphasis on clean air and health, domestic heating, as well as funding opportunities for clean air measures.

The Commission provides further support to Member States in the implementation of Directive (EU) 2016/2284 through different means, including Clean Air Dialogues, capacity building and the Ambient Air Quality expert group. Clean Air Dialogues are bilateral meetings between the Commission and a Member State to foster actions that will enhance air quality and reduce air pollution, bringing together different actors and sectors in a collaborative approach. They address the specific situation and needs of a Member State, promote best practices and inform about funding opportunities. In the period 2017-19, seven dialogues have taken place: with Ireland, Luxembourg, Hungary, Slovakia, Spain, Czechia and Italy.

To help Member States improve their ability to produce reliable projections of air pollutant emissions, the Commission launched a capacity building project in 2018 in which ten Member States participated. One of the results of the project was the development of guidance material on the preparation of projections accessible to all Member States. Furthermore, since 2014 the Copernicus Earth Observation programme supplies, through its core Atmosphere Monitoring Service (CAMS), continuous data and information describing air quality and its evolution at national and European level.

5.2. Uptake of Union funds to support the objectives of Directive (EU) 2016/2284

Article 7 of the Directive requires the Commission "to endeavour to facilitate [Member States'] access to existing Union funds" in order to support the achievement of the objectives of the Directive. Article 11(1)(c) of the Directive requires the Commission to report on this uptake.

EU funding, under various financing programmes, has been made available and successfully used by Member States over the years, to improve air quality. This funding either directly supports clean air projects or effectively include clean air objectives in other investments (e.g. infrastructure, rural and regional development). To monitor progress in the Member States' uptake of these EU funds, the Commission has developed a methodology that assesses the extent to

[57] https://ec.europa.eu/environment/air/clean_air/forum.htm

which each funding stream contributes to clean air objectives. This monitoring will also help Member States in implementing clean air policies.

This methodology is presented in Annex 4 to this report, as well as the estimated amounts of EU funds contributing to clean air objectives. The Commission will report annually on clean air financing in the framework of its draft budget, for each relevant funding programme.

5.3. Follow-up to the Commission "Methane Declaration"

While overall EU methane emissions have decreased by 17% between 2005 and 2017 (same rate as overall greenhouse gases), methane emissions from the agriculture sector have decreased by 1.6 % over the same period (leading to an increased share of the agricultural sector)[58].

The Commission proposal for Directive (EU) 2016/2284 included an emission reduction commitment for methane due to the urgency of tackling emissions from this pollutant both from clean air (methane being an important ozone precursor) and climate perspectives. The European Parliament and the Council however decided to remove the reference to methane during the adoption process, leaving this pollutant unregulated under the Directive. The Commission subsequently issued a declaration published at the end of the Directive. The declaration reads as follows:

"The Commission considers that there is a strong air quality case for keeping the development of methane emissions in the Member States under review in order to reduce ozone concentrations in the EU and to promote methane reductions internationally […]. It confirms that […] it intends to further assess the impact of methane emissions on achieving the objectives […] of the NEC Directive and will consider measures for reducing those emissions, and where appropriate, submit a legislative proposal to that purpose".

The Commission has worked on this further assessment[59].

The Communication on the European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy by 2050 has assessed the options for further reducing methane emissions in all sectors in the EU[60]. Its supporting in-depth analysis showed that there is still a potential for further reducing methane

[58] Source : EEA (https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer)

[59] With the publication of a study on the links between methane emissions and ozone concentrations https://ec.europa.eu/jrc/en/publication/global-trends-methane-emissions-and-their-impacts-ozone-concentrations and two studies (including one still ongoing) on the further potential to reduce methane emissions in the energy sector and on the impact of the use of biomethane and hydrogen on gas infrastructure.

[60] Commission Communication: A Clean Planet for all A European strategic long-term vision for a prosperous, modern, competitive and climate neutral economy, COM(2018))773 final

emissions in all sectors concerned: agriculture, waste and wastewater, as well as energy.[61]

The Commission continues to believe that methane emissions should be kept under review with the aim to limit their contribution to ozone concentrations in the EU and to reduce methane emissions internationally, putting the Union in a leadership position in developing synergies towards fighting both climate change and air pollution. Building upon analysis carried out over the past years and in line with the Clean Air Outlook in 2018, the Commission Declaration above remains fully valid.

5.4. International linkages

Directive (EU) 2016/2284 is closely inter-linked with the UNECE Convention on Long-range Transboundary Air Pollution (the Air Convention) and its Protocols[62]. To the extent possible, synergies between the two legal regimes are explored and cooperation is ensured, notably with regard to the reporting of emission inventories and projections. A joint inventory guidebook for common methodology has been developed and continuously improved with the support of the EEA. The amended Gothenburg Protocol to the Air Convention, which entered into force on 7 October 2019, and the Directive largely correspond as regards emission reduction commitments for the period 2020-2029. The Gothenburg Protocol will be reviewed within the Air Convention framework as from 2020, providing an opportunity to consider further alignment of these two legal regimes, including as regards the development of an approach relating to e.g. methane and black carbon emissions.

6. Conclusion

Putting the implementation of Directive (EU) 2016/2284 on the right track from the outset is crucial in order to ensure timely reductions in air pollutants emissions, contribute effectively to improved human and ecosystem health and deliver on the Commission's 'zero pollution ambition for a toxic free environment' under the European Green Deal.

It is still premature to draw definite conclusions on Member States' distance to target and trajectories to compliance on the basis of actual emissions as 2020 data will only become available for compliance checking in 2022. This said, projected emission data and the analysis of NAPCPs clearly point to the need for stepped up efforts already in the short-term.

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61 https://ec.europa.eu/clima/sites/clima/files/docs/pages/com_2018_733_analysis_in_support_en_0.pdf (see in particular pages 159 to 174).

62 https://ec.europa.eu/environment/air/policy/index.htm

As NAPCPs form a fundamental instrument of the Directive, it is all the more important that they are prepared in time and based on good quality data, updated when emission reduction commitments are projected not to be achieved, and in any case at least every four years. To this end, Member States have to continue to explore additional and more stringent measures to ensure further and fully effective reductions of their national air pollutant emissions in an efficient manner. Ammonia stands out in this respect. As was already highlighted in the first Clean Air Outlook in 2018, ammonia emissions remain an exception to overall improvements to date. The agricultural sector will need to engage further in delivering the required reductions. The Commission will continue to monitor and support national efforts in this regard, through financial and non-financial tools. For the former, this will be achieved, inter alia, through maximising the use of Common Agricultural Policy funding in the upcoming programming cycle. For the latter, this will be done, inter alia, through capacity building actions and the promotion of further synergies with the implementation of relevant EU legislation, such as the Nitrates Directive 91/676/EEC and the Industrial Emissions Directive 2010/75/EU. Furthermore, the review of the latter Directive will address the potential for further contributing to emission reductions, including for ammonia.

The full implementation of the European Green Deal and scaled-up support from the Just Transition Fund and relevant Union funding programmes under the new programming cycle will considerably facilitate the achievement of the objectives of Directive (EU) 2016/2284. Many Green Deal initiatives will deliver important co-benefits for a more efficient and quicker implementation of the Directive. First and foremost, a higher climate ambition that materialises in the form of increased energy efficiency and the further development of non-combustible renewable energy sources will reduce air pollutants emissions alongside greenhouse gases. At the same time, the implementation of Directive (EU) 2016/2284 will also be instrumental in making a success of the transition towards the 'zero pollution ambition for a toxic free environment' called for by the European Green Deal.

In addition to the present report, the forthcoming second Clean Air Outlook, to be published later in 2020, will shed light on costs, benefits, synergies and trade-offs of current and projected levels of implementation of the Directive and highlight the potential needs for further actions, both at national and EU level.