Review of the National Air Pollution Control Programme – Croatia

Final Report for European Commission – DG Environment
Specific contract 070201/2018/791186/SER/ENV.C.3

Aether
Table of contents

1 Introduction ................................................................................................................................................. 4
  1.1 Review of the National Air Pollution Control Programmes ................................................................. 4
  1.2 Methodology ......................................................................................................................................... 5
  1.3 NAPCP submission documents .......................................................................................................... 6

2 Projected compliance with NECD emission reduction commitments ............................................. 8
  2.1 Margin of compliance .......................................................................................................................... 8
  2.2 Projected compliance and consistency with projections submitted under Article 10(2) .......... 9

3 Findings of the in-depth NAPCP review ................................................................................................. 14
  3.1 NAPCP overview (M) ....................................................................................................................... 14
  3.2 Executive summary (O) .................................................................................................................... 14
  3.3 The national air quality and pollution policy framework (M, O) ...................................................... 14
  3.4 Progress made by current PaMs in reducing emissions and the degree of compliance with national and EU obligations, compared to 2005 (M, O) .................................................................................. 15
  3.5 Projected situation assuming no change in currently adopted PaMs (M, O) ............................. 17
  3.6 Policy options considered to comply with emission reduction commitments for 2020 and 2030, intermediate emission levels for 2025 and stakeholder consultation (M, O) ................................................. 18
  3.7 The policies selected for adoption by sector including timetable for adoption, implementation and review and responsible competent authority (M, O) ................................................................. 22
  3.8 Projected combined impacts of PaMs on emission reductions, air quality and the environment and associated uncertainties (where applicable) (M, O) ................................................................. 25

4 Conclusions and recommendations ...................................................................................................... 28
  4.1 Conclusions ....................................................................................................................................... 28
  4.2 Recommendations ............................................................................................................................ 29

Appendices

Appendix 1 Completeness assessment
Appendix 2 Assessment of the risk of non-compliance
Abbreviations

BaP    Benzo(a)pyrene
BAT    Best Available Technique
BC     Black Carbon
CH4    Methane
CO2    Carbon dioxide
EEA    European Environment Agency
Eionet The European Environment Information and Observation Network
EU     European Union
ETS    Emission trading system
GHG    Greenhouse Gas
kt     Kilo tonne
NAPCP  National Air Pollution Control Programme
NECP   National Energy and Climate Plans
NFR    Nomenclature for Reporting
NH3    Ammonia
NMVOC  Non-Methane Volatile Organic Compounds
NO2    Nitrogen dioxide
NOx    Nitrogen oxides
O3     Ozone
PaMs   Policies and Measures
PM10   Particulate matter 10 micrometres or less in diameter
PM2.5  Particulate matter 2.5 micrometres or less in diameter
RAG    Red; Amber; Green [rating]
SO2    Sulphur dioxide
WAM    With Additional Measures
WHO    World Health Organisation
WM     With Measures
1 Introduction

1.1 Review of the National Air Pollution Control Programmes

1.1.1 This report

The following report presents the results of the review of the National Air Pollution Control Programme (NAPCP) submitted to the European Commission by Croatia. A draft NAPCP was provided by the European Commission on 29 March 2019 for the purpose of the review. A final NAPCP was submitted on 11 October 2019 and the review was amended to reflect this final submission.

EU Member States are required to prepare and report their NAPCP according to the minimum content and common format (Commission Implementing Decision (EU) 2018/1522)1 stipulated by Article 6 of the Directive (EU) 2016/2284 on the reduction of national emissions of certain atmospheric pollutants2, hereafter referred to as the Directive or the NECD3. The NAPCP should demonstrate compliance with the Member State’s respective emission reduction commitments and set out how compliance will be achieved.

This review has been undertaken alongside a review of national air pollutant emission projections developed and reported by Member States under Article 10(2) of the NECD. These reviews have been commissioned by the European Commission as Service Request 2 under the Framework Contract No ENV.C.3/FRA/2017/0012 (specific contract 070201/2018/791186/SER/ENV.C.3).

The review of the first NAPCPs and of the air pollution projections with regards to their fulfilment of the requirements of the NECD will both contribute to the Commission’s reporting on the implementation of the NECD required under Article 11 of the NECD.

This report feeds into the horizontal review report under the contract which presents conclusions and recommendations from the review at the EU-level. The horizontal report also contains, for each Member State, an assessment of its risk of non-compliance with its emission reduction commitments, based on a cross-analysis of the information provided in the NAPCPs and projection submissions under Article 10(2) of the NECD. This risk assessment is also presented in Appendix 2 to the present report, while details on the methodology for that risk assessment are found in the horizontal report.

1.1.2 Objectives of the NAPCP review

The purpose of the following report is to determine Member State compliance with the requirements of the NECD. The scope of the NAPCP review includes:

- The use of the NAPCP common format.
- NAPCP compliance with the minimum content requirements of the Directive (mandatory content (M)).
- The extent to which the optional content requirements (O) of the Directive are reported and what added value this brings to the quality of the NAPCP.
- Consistency between the NAPCP and the information in the air pollutant emission projections that were due to be submitted by Member States by 15 March 2019.

---


3 Directive (EU) 2016/2284 repeals and replaces the previous National Emission Ceilings Directive (2001/81/EC) and is generally referred to as the new NECD or simply the NECD.
• The extent to which Member States are reliant on additional PaMs (as included in the ‘With Additional Measures’ (WAM) scenario) to achieve compliance.

• The extent to which the evidence provided on selected PaMs is robust and the level of confidence it provides that Member States will achieve their 2020 and 2030 emission reduction commitments.

• The extent to which additional PaMs are put forward in view of wider air quality objectives as set out in Article 1(2) of the NECD (referring to the objectives of the Ambient Air Quality Directives, the Union’s long-term objective of achieving levels of air quality in line with the air quality guidelines of the World Health Organisation (WHO), the Union’s biodiversity and ecosystem objectives and coherence with climate and energy policy priorities).

• The degree of coherence with other plans and programmes in other policy areas, predominantly the National Energy and Climate Plans (NECP).

1.2 Methodology

The key components of the review process are outlined in Figure 1-1. A comprehensive description of the process, methodology and checks followed are detailed in accompanying review guidelines which were provided to the NAPCP reviewers responsible for conducting this report.

Figure 1-1 Overview of the NAPCP review methodology

A central review team was used to conduct the initial screening checks. The purpose of the initial screening was to document Member State submissions in one central data log. For example, the information recorded includes the date, language and length of the NAPCP submission; accompanying annexes are similarly reviewed and logged and links to external websites are checked. The initial checks also record if the Member State uses the NAPCP common format.

The completeness assessment and in-depth review checks are structured according to the section headings of the NAPCP common format. Together, the review findings inform the extent to which the NAPCP is compliant with the minimum content requirements, the extent to which evidence is robust and the level of confidence that the Member State will achieve its commitments.

NAPCP completeness is rated according to a RAG rating (Red, Amber, Green rating as described in Appendix 1) while the in-depth checks involve a series of questions with pre-defined responses to be chosen from, designed to systematically determine the robustness and reliability of the evidence submitted.
1.3 NAPCP submission documents

An overview of the Member State’s NAPCP is presented in the table below. This information was gathered as part of the NAPCP initial screening.

<table>
<thead>
<tr>
<th>Initial screening check</th>
<th>Response</th>
<th>Additional comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Was the NAPCP submitted by 1 April 2019?</td>
<td>No</td>
<td>The final NAPCP was uploaded to the European Environment Information and Observation Network (Eionet) on 11 October 2019. A draft version of the NAPCP was submitted to the European Commission on 29 March 2019.</td>
</tr>
<tr>
<td>Was the common format used?</td>
<td>Yes, fully</td>
<td></td>
</tr>
<tr>
<td>What is the length of the NAPCP?</td>
<td>111 pages</td>
<td></td>
</tr>
<tr>
<td>What language is the NAPCP reported in?</td>
<td>Croatian</td>
<td></td>
</tr>
<tr>
<td>What language is the supporting documentation reported in?</td>
<td>English</td>
<td>An accompanying report (183 pages) is provided in English. A cover letter in English (2 pages) is also provided.</td>
</tr>
<tr>
<td>How many external documents are referenced or provided in the NAPCP?</td>
<td>Six</td>
<td></td>
</tr>
<tr>
<td>Is it possible to identify the required information in the external documents (i.e. is the page and chapter reference provided)?</td>
<td>Yes</td>
<td>Weblinks are provided to external supporting datasets.</td>
</tr>
<tr>
<td>Can all external documents be accessed?</td>
<td>Yes</td>
<td>All weblinks provided are in working order.</td>
</tr>
</tbody>
</table>

Completeness assessment

A completeness assessment was conducted to identify gaps in reporting according to the minimum content requirements of the common format (Commission Implementing Decision (EU) 2018/1522). The completeness assessment also reviewed the extent of reporting of optional content by the Member States. The results are presented in Appendix 1 to this review. To summarise, the Croatian NAPCP includes the minimum content required for:

- Policy priorities for emission reductions and other relevant policy priorities and the responsible authorities involved (section 2.3).
- Progress made by current PaMs in reducing emissions and improving air quality together with transboundary impacts (section 2.4).
- Projected emissions and emission reductions with existing measures (section 2.5).

---

4 http://cdr.eionet.europa.eu/hr/eu/nec_revised/programmes/envxabgha/
• Additional PaMs considered and selected PaMs for adoption which have been reported by the Member State using the EEA PaM-tool (sections 2.6 and 2.7).
• Projected emissions and emission reductions with additional measures (section 2.8).

The completeness assessment identified the following gaps:
• The contact details of the authority responsible for drafting the programme is not specified in section 2.1 of the NAPCP.
• The inventory year underpinning the NAPCP projections was not provided.
• The projected degree of compliance with air quality objectives is not made explicit in section 2.5.2.

The Member State has reported the following optional content from the NAPCP common format:
• An Executive Summary in line with the common format (section 2.2).
• Graphics to illustrate the progress achieved by current PaMs in emission reductions per pollutant (section 2.4.1).
• Maps to show concentrations of air quality pollutants for the year 2015 and a description with regards to a specific air quality zone where problems have been identified for PM$_{10}$ (section 2.4.2).
• Data and methodology related to transboundary impacts of domestic emission sources (section 2.4.3).
• The associated uncertainties for each NECD pollutant (section 2.5.1) and a sensitivity analysis in the accompanying report (section 4.1.2).
• Effects of considered PaMs on additional pollutants beyond the scope of the NECD (including CH$_4$, CO$_2$, N$_2$O and PM$_{10}$) (section 2.6.1)
• Estimation of costs and benefits of some individual PaMs considered in order to comply with the emission reduction commitments (section 2.6.3).
• Indicators to monitor progress under the WAM scenario (section 2.7) Projected improvements in air quality are reported as being not available. Nonetheless a short qualitative description is provided for NO$_2$, PM and O$_3$ (section 2.8.4).
2 Projected compliance with NECD emission reduction commitments

2.1 Margin of compliance

There are several different metrics that can be used to show the “margin of compliance” i.e. the margin by which compliance with the NECD emission reduction commitments is achieved or missed.

The following two approaches have been used in the overall assessment of NAPCPs and projections to calculate the margin of compliance:

1. **Calculating the difference between an emission reduction commitment and the projected emission reductions (difference expressed in percentage points)** – this approach is presented in the NAPCP review reports and follows the same approach as required in the NAPCP format. The emission reduction commitments specified in Annex II of the NECD are defined as percentage reductions on the 2005 emissions. Projected emissions of pollutants in 2020 and 2030 are compared to the 2005 emissions to calculate the projected emission reductions. These projected reductions are then divided by the 2005 emissions to obtain the projected reductions as a percentage of the 2005 emissions. These percentage reductions are then compared to the legally binding percentage reduction, with the difference between them representing the compliance margin expressed as percentage points. As such, negative percentage points indicate that the emission reduction commitment will not be met.

**Example**

A Member State emitted 500 kt of a pollutant in 2005 and had a 20% emission reduction commitment for 2020. If the 2020 projected emission is 360 kt, the projected emission reduction is 140 kt. This equates to 28% of 2005 emissions. The projected margin of compliance is 8 percentage points. This is illustrated in the figure below.
2. Calculating the difference between projected emissions and the compliance threshold (expressed as a percentage of the compliance threshold) – this approach is presented in the projections review reports and follows the same approach as used in the context of emissions inventories.

Given that each emission reduction commitment specified in Annex II of the NECD is defined as a percentage reduction on the 2005 emissions, these two values can be combined to express a "compliance threshold" i.e. the maximum emission that can be emitted by a Member State from 2020 and 2030 onwards, and still be compliant with the emission reduction commitment for a pollutant. Projected emissions (under the WM and WAM scenarios) can be compared to the compliance threshold, and the compliance margin expressed as a percentage of the compliance threshold.

**Example**

A Member State emitted 500 kt of a pollutant in 2005 and had a 20% emission reduction commitment for 2020. The maximum the Member State can emit in 2020 to achieve its 2020 emission reduction commitment (the "compliance threshold") is 400 kt. If the 2020 projected emission is 360 kt, the commitment will be met by 40 kt and the projected margin of compliance is 10% of the compliance threshold.

Mathematically these two approaches are different as they use different reference points. However, they yield the same conclusions concerning compliance or non-compliance with the NECD reduction commitments. The largest numerical differences between the two approaches occur when there are significant differences between the 2005 emissions and the projected emissions for 2020 or 2030 (this is in particular the case for \( \text{SO}_2 \)).

The percentage point approach is used in the review of the NAPCP to understand the margin of compliance between the projected emission reductions presented in the NAPCP and the legally binding percentage emission reduction commitments (see Section 2.2 of this report).

The results of the projections review and of the assessment of the NAPCPs are brought together in the risk assessment for individual Member States (see Appendix 2 of this report), using the margin of compliance expressed as a percentage of the compliance threshold based on projections submitted under Article 10(2). The methodology for assessing the risk of non-compliance is explained in the accompanying horizontal review report.

**2.2 Projected compliance and consistency with projections submitted under Article 10(2)**

- With existing measures (table 2.5.1 of the Croatian NAPCP), the 2020-2029 national commitments are projected to be achieved in the case of all pollutants. For 2030 onwards, all commitments are projected to be achieved, except for \( \text{NH}_3 \). Emissions of this pollutant are projected to increase between 2020 and 2030.
- With additional measures (table 2.8.1 of the NAPCP), national emission reduction commitments for 2020-29 and 2030 onwards are projected to be achieved for all pollutants.
- Different 2005 baseline data are used for the projections in the NAPCP compared to those used in the review of projections submitted under Article 10(2), which affects the conclusions on projected compliance for \( \text{NH}_3 \).

The projections presented in this section are derived from the information reported by the Member State in their NAPCP. Croatia included projections from October 2018, using historical inventory data from
2016 in the NAPCP. The NAPCP projections present the same data (total kt) as the projections data submitted separately by the Member State under Article 10(2) of the Directive in March 2019; however, the baseline year data presented in the NAPCP and used in the 2019 projections review are different for all pollutants. In its Article 10(2) projections, Croatia indicated that their emission projections are based on 2016 historical emissions. However, the review established that the projections were based on the 2016 historical emissions from the 2019 submission of the historical emission inventory. For that reason, in the review of Article 10(2) projections, 2005 emissions from the 2019 historical inventory submission were used to assess compliance, in order to ensure consistency with the projections scenarios. The difference between 2005 emissions in the NAPCP and emissions used in the review of Article 10(2) projections affects the projected emission reductions as a percentage of the baseline year and leads to different conclusions on projected compliance for NH₃.

The emission reductions needed for 2025 are interpolated according to the 2020-29 and 2030 onwards commitments set out in the NECD. Additional information is included to demonstrate the extent to which the projections meet the Member State commitments (shown, for each of the pollutants, as the difference expressed in percentage points between the projected emission reduction described in the NAPCP and the legal commitment). The percentage points do not represent the extent to which total emissions projected (kt) compare to the emission reduction commitment (in terms of kt of emissions).

**Under the WM scenario, progress towards the 2020-29 emission reduction commitments is as follows:**

- **SO₂** - The projections of SO₂ emissions under the WM scenario show that Croatia can comply with the 2020-29 reduction commitments specified in the NECD with existing measures. In 2020, compliance with the emissions reduction commitments is projected to be achieved with a margin of 28 percentage points.

- **NOₓ** - The projections of NOₓ emissions under the WM scenario show that Croatia can comply with the 2020-29 reduction commitments specified in the NECD with existing measures. In 2020, compliance with the emissions reduction commitments is projected to be achieved with a margin of 20 percentage points.

- **NMVOC** - The projections of NMVOC emissions under the WM scenario show that Croatia can comply with the 2020-29 reduction commitments specified in the NECD with existing measures. In 2020, compliance with the emissions reduction commitments is projected to be achieved with a margin of 22 percentage points.

- **NH₃** - The projections of NH₃ emissions under the WM scenario show that Croatia can comply with the 2020-29 reduction commitment specified in the NECD with existing measures. In 2020, compliance with the emissions reduction commitments is projected to be achieved with a margin of 20 percentage points.

- **PM₂.₅** - The projections of PM₂.₅ emissions under the WM scenario show that Croatia can comply with the 2020-29 reduction commitments specified in the NECD with existing measures. In 2020, compliance with the emissions reduction commitments is projected to be achieved with a margin of 37 percentage points.

**Under the WM scenario, progress towards the 2030 onwards commitments is as follows:**

- **SO₂** - The projections of SO₂ emissions under the WM scenario show that Croatia can comply with the 2030 reduction commitments specified in the NECD with existing measures. In 2030, compliance with the emissions reduction commitments is projected to be achieved with a margin of 1 percentage point.

- **NOₓ** - The projections of NOₓ emissions under the WM scenario show that Croatia can comply with the 2030 reduction commitments specified in the NECD with existing measures. In 2030,
compliance with the emissions reduction commitments is projected to be achieved with a margin of 3 percentage points.

- **NMVOC** - The projections of NMVOC emissions under the WM scenario show that Croatia can comply with the 2030 reduction commitments specified in the NECD with existing measures. In 2030, compliance with the emissions reduction commitments is projected to be achieved with a margin of 11 percentage points.

- **NH₃** - The projections of NH₃ emissions under the WM scenario show that Croatia cannot comply with the 2030 reduction commitment specified in the NECD with existing measures. The level of emissions will increase incrementally between 2020 and 2030. In 2030, compliance with the emissions reduction commitments is projected to be missed with a margin of 9 percentage points.

- **PM₂.₅** - The projections of PM₂.₅ emissions under the WM scenario show that Croatia can comply with the 2030 reduction commitments specified in the NECD with existing measures. In 2030, compliance with the emissions reduction commitments is projected to be achieved with a margin of 7 percentage points.

**Figure 2-2** Projected attainment of emission reduction commitments (WM scenario used in the NAPCP)

Note: The extent to which the projections meet the Member State commitments is shown, for each of the pollutants, as the difference expressed in percentage points between the projected emission reduction described in the NAPCP and the legal commitment. A negative number indicates that the commitment is projected to be missed.

As the projections under the WM scenario demonstrate a gap in compliance with the Member State NECD emission reduction commitments for certain pollutants, the NAPCP includes projections under a ‘With Additional Measures’ (WAM) scenario.

**Under the WAM scenario, progress towards the 2020-29 emission reduction commitments is as follows:**

- **SO₂** – The projections of SO₂ emissions under the WAM scenario show that Croatia can meet the 2020-29 reduction commitments specified in the NECD with additional measures. In 2020, compliance with the emission reduction commitments is projected to be achieved with a margin of 32 percentage points.
• **NO\textsubscript{X}** - The projections of NO\textsubscript{X} emissions under the WAM scenario show that Croatia can comply with the 2020 reduction commitments specified in the NECD with additional measures. However, in 2020, compliance with emissions reduction commitments is projected to be achieved with a margin of 21 percentage points.

• **NMVOC** - The projections of NMVOC emissions under the WAM scenario show that Croatia can comply with the 2020 reduction commitments specified in the NECD with additional measures. However, in 2020, compliance with emissions reduction commitments is projected to be achieved with a margin of 23 percentage points.

• **NH\textsubscript{3}** - The projections of NH\textsubscript{3} emissions under the WAM scenario show that Croatia can comply with the 2020 reduction commitments specified in the NECD with additional measures. In 2020, compliance with the emissions reduction commitments is projected to be achieved with a margin of 22 percentage points.

• **PM\textsubscript{2.5}** - The projections of PM\textsubscript{2.5} emissions under the WAM scenario show that Croatia can comply with the 2020 reduction commitments specified in the NECD with additional measures. In 2020, compliance with the emissions reduction commitments is projected to be achieved with a margin of 37 percentage points.

**Under the WAM scenario, progress towards the 2030 onwards commitments is as follows:**

• **SO\textsubscript{2}** – The projections of SO\textsubscript{2} emissions under the WAM scenario show that Croatia can comply with the 2030 onwards reduction commitments specified in the NECD with additional measures. In 2030, compliance with the emission reduction commitments will be achieved by a margin of 6 percentage points.

• **NO\textsubscript{X}** - The projections of NO\textsubscript{X} emissions under the WAM show that Croatia can comply with the 2030 onwards reduction commitments specified in the NECD with additional measures. In 2030, compliance with the emission reduction commitments will be achieved by a margin of 7 percentage points.

• **NMVOC** - The projections of NMVOC emissions under the WAM scenario show that Croatia can comply with the 2030 onwards reduction commitments specified in the NECD with additional measures. In 2030, compliance with the emission reduction commitments will be achieved by a margin of 17 percentage points.

• **NH\textsubscript{3}** - The projections of NH\textsubscript{3} emissions under the WAM scenario show that Croatia can comply with the 2030 onwards reduction commitments specified in the NECD with additional measures. In 2030, compliance with the emission reduction commitments will be achieved by a margin of 12 percentage points.

• **PM\textsubscript{2.5}** - The projections of PM\textsubscript{2.5} emissions under the WAM scenario show that Croatia can comply with the 2030 onwards reduction commitments specified in the NECD with additional measures. In 2030, compliance with the emission reduction commitments will be achieved by a margin of 12 percentage points.
Figure 2-3 Projected attainment of emission reduction commitments (WAM scenario used in the NAPCP)

Note: The extent to which the projections meet the Member State commitments is shown, for each of the pollutants, as the difference expressed in percentage points between the projected emission reduction described in the NAPCP and the legal commitment.

As stated above, the differences between the 2005 baseline year data presented in the NAPCP and those used in the review of 2019 projections submitted under Article 10(2) affect the conclusions on projected compliance for NH$_3$ under the WM scenario only. Contrary to what is depicted in Figure 2-2, according to the review of projections submitted under Article 10(2) both the 2020-29 and 2030 onwards commitments for this pollutant are projected to be achieved.

Further analysis related to the risk of non-compliance, taking into account the information provided in both the NAPCP and the projections submissions, is presented in Appendix 2.
3 Findings of the in-depth NAPCP review

3.1 NAPCP overview (M)

- The common format was used for the NAPCP. An accompanying report, including the tables of the common format and additional information has been also submitted.
- No weblink is provided to access the NAPCP online.

The NAPCP adheres to the common format specified by the Commission Implementing Decision (EU) 2018/1522, pursuant to Article 6 of the NECD. The NAPCP is made up of one main report (111 pages). It is accompanied by a detailed report (183 pages) (hereafter referred to as ‘the accompanying report’), that contains the tables established by the common format with additional sections. The section and table numbering used in the accompanying report does not correlate with the numbering in the common format. The NAPCP was submitted on 11 October 2019. Information on PaMs was reported via the EEA-PaM tool on 4 October 2019.

A further six external documents/ websites are referenced in the NAPCP. Of the six external links provided, all are in working order. External references are publicly available. They point to data sources and studies on the webpage of the Croatian environment agency and to reports on CEIP site. All these are relevant and recent.

Croatia has clearly titled the NAPCP and specified the responsible competent authority for the programme. Contact details are not provided and no link to the website where the programme is published is specified.

A link to the consultation activities conducted during preparation of the NAPCP is not provided. A description of the consultation process, relevant authorities and stakeholders is provided in chapter 6 of the accompanying report.

The NAPCP includes analysis of transboundary impacts of emissions but it does not refer to any form of transboundary consultation being conducted.

3.2 Executive summary (O)

Croatia has provided an executive summary consistent with the common format in terms of content and layout. The summary is 33 pages long and thus exceeds the recommended length of 10 pages. The information included in the summary is consistent with main sections of the NAPCP.

3.3 The national air quality and pollution policy framework (M, O)

- Air quality policy priorities are described and an overview of relevant objectives is given. WHO guideline values are not referenced.
- The climate related policy framework is described. An overview of relevant policy priorities for agriculture, industry and transport, waste sector priorities are also provided in the NAPCP.
- Roles of different authorities are described with relevant details. The coordinating role is with the Government of Croatia and the implementation is mainly the responsibility of the Ministry of Environment and Energy.
The NAPCP provides a qualitative overview of air quality in Croatia, reporting challenges with concentrations of PM$_{10}$, O$_3$, BaP and NO$_2$, for which daily and annual limit value exceedances are occurring. This corresponds to the information in the EEA air quality country factsheet for Croatia. No reference to the WHO guideline values is made in the description of the air quality priorities, suggesting that the current air policy framework in Croatia does not aim to exceed the level of ambition set by the EU AAQD.

The NAPCP describes that the National Climate Change Policy in Croatia is laid down by Chapter VIII of the Air Protection Act (NN Nos 130/11, 47/14 and 61/17). Based on that, the policy objectives are included in two documents: the draft Low-emission Development Strategy and the draft Strategy for Adaptation to Climate Changes. According to the information presented in the NAPCP, sectors regulated by the EU Effort-Sharing Regulation in Croatia may increase their GHG emissions by 11 percent by 2020 compared to 2005 emission levels.

The NAPCP presents the objectives and national targets for energy efficiency up to 2020, as set by the Energy Development Strategy of the Republic of Croatia (NN No 130/09) and its accompanying action plan. Targets for renewable energy sources are established under the same strategy but have not been presented in the NAPCP.

In addition to sectoral policy priorities for agriculture, industry and transport, Croatia has included the policy priorities for waste sector that are based on the Waste Management Plan of the Republic of Croatia for 2017-2022.

The relevant authorities are reported in accordance with the minimum content requirements of section 2.3.2 of the common format. The Parliament and the Ministry of Environment and Energy are responsible for policy making. The coordination role is attributed to the national government. The main body responsible for the implementation air pollution and air quality related legislation is the Ministry of Environment and Energy, however for certain sectors (not specified in the NAPCP) other ministries are responsible for policy making and implementation. Enforcement is the responsibility of the Ministry of Environment and Energy as well, together with the State Inspectorate and its regional authorities. Monitoring is attributed to the Croatian Meteorological and Hydrological Service, that also assists the Ministry with reporting tasks. At local and regional levels, air quality activities are performed by municipal offices and county offices (the City of Zagreb and major cities). Overall the roles are well defined and clearly allocated, but reporting in the NAPCP is overly detailed, making it hard to identify the key messages.

### 3.4 Progress made by current PaMs in reducing emissions and the degree of compliance with national and EU obligations, compared to 2005 (M, O)

#### 3.4.1 Progress made by current PaMs in reducing emissions

- Emission trends have been provided in the NAPCP, showing a decrease in emissions of all NECD pollutants between 1990 and 2016.
- Annex 1 of the accompanying report describes the current PaMs which have contributed to these emission reductions.
Detailed emission trends by NECD pollutant are presented in the NAPCP, alongside the analysis of the key emission sources. The trends show a decrease in emissions of all NECD pollutants between 1990 and 2016. The largest emission reductions can be observed for SO$_2$ emissions (92 percent), followed by NMVOC (59 percent), NO$_x$ (50 percent), PM$_{2.5}$ (46 percent) and NH$_3$ (34 percent). Reductions in emissions between 1990 and 2016 have been driven mainly by the economic trends and the uptake of environmental regulations.

PaMs that contributed to the reductions are described in brief in the NAPCP together with a broader description in Annex 1 of the accompanying report that also includes relevant EU legislation. PaMs are described by sector and cover PaMs for energy; transport; industrial processes and product use; agriculture; waste and other (cross-cutting).

The impact of individual PaMs on the reported emission reductions is not presented in the NAPCP. From the brief descriptions presented in the NAPCP, key emitting sources and the most significant PaMs contributing to emission reductions are identified by pollutant as:

- **SO$_2$** reductions, beside the economic trends, have been achieved primarily through a shift in fuels used for transport (regulated sulphur content of fuels) and for energy production, and the opening of a new coal-fired thermal power station equipped with flue gas desulphurisation technology.

- **NO$_x$** emission reductions are a result of stricter emission standards in transport (European emission standards) and the decreasing output of several economic activities (namely aluminium, pulp and paper, coal and agriculture). In addition, several current PaMs are supporting low-emission transport.

- **NH$_3$** emissions originate mainly from agriculture, with the use of urea-based fertilisers named as the main source of emissions. No current PaM aimed to reduce NH$_3$ emissions is described. The NAPCP only mentions the implementation of the Rural Development Programme as driver for emission reductions in this sector.

- For NMVOCs, the implementation of relevant EU legislation (IPPC, IED and VOC Directives) is mentioned as the important driver for emission reductions, beside the decreasing production and population.

- The decrease in PM emissions is attributed to the modernisation, through replacement, of old domestic ovens and boilers however no reference to any specific PaM is made.

Emission trends are illustrated using linear charts and the share of sectors in total emissions of each pollutant is shown using pie charts.

**3.4.2 Progress made by current PaMs in improving air quality**

- O$_3$, NO$_2$, PM and BaP in PM present an air quality challenge in Croatia. The presented data show no improvement in the situation since 2013.

From the qualitative analyses provided in the NAPCP it can be seen that compliance with target and limit values for O$_3$, NO$_2$, PM and BaP in PM presents a challenge to Croatia. In 2016, out of the nine air quality zones, the following number were non-compliant:

- five with the target value for O$_3$;
- three with PM$_{10}$ limit values;
- two with BaP limit values; and
- one with NO$_2$ limit values.
Compared to 2013 data presented in the NAPCP, this demonstrates a lack of improvement for PM$_{10}$, and a worsening of the situation for NO$_2$, O$_3$, PM$_{2.5}$ and BaP.

Current PaMs intended to contribute to air quality improvements are not described in the NAPCP. Impacts of current PaMs on air quality are not described in Annex 1 of the accompanying report. Air quality action plans for non-compliant zones are referenced but PaMs included in these plans are not detailed.

Maps are referenced to show concentrations for SO$_2$, NO$_2$, PM$_{10}$, PM$_{2.5}$, O$_3$, heavy metals and B(a)P for the period 2001-2015. The maps are based on modelled values (based on the latest EMEP model from 2016) and are presented for each pollutant in the NAPCP.

### 3.4.3 Current transboundary impact of national emission sources

Current transboundary impacts are described in quantitative terms for SO$_2$, NO$_x$ and NH$_3$. The NAPCP concludes that depositions of transboundary emissions in Croatia are greater than the impact of its domestic emission sources on neighbouring countries (i.e. that Croatia is a net importer of emissions). SO$_2$ emissions come mainly from the republic of Bosnia and Herzegovina, and NO$_x$ and NH$_3$ from Italy.

Pie charts are presented in the NAPCP to show the impact of national emissions on other countries but they are illegible. The description does not describe the detail of the charts presented.

Transboundary impacts related to PM are not described in the NAPCP. The review of the NAPCP notes that as there are air quality problems with PM concentrations in ambient air, it is likely that transboundary impacts of this pollutant are relevant and should therefore be included in the assessment.

### 3.5 Projected situation assuming no change in currently adopted PaMs (M, O)

- According to the NAPCP projections, Croatia is projected to achieve its 2020-29 national commitments for all pollutants under a WM scenario. Under the same scenario presented in the NAPCP, 2030 onwards commitments are projected to be achieved for all pollutants except NH$_3$.

- The projected degree of compliance with air quality objectives is not described in the NAPCP.

In accordance with section 2.5.1 of the common format, emission projections under a WM scenario are presented in the NAPCP for all NECD pollutants for the period of 2020-29 and 2030 onwards compared with a 2005 base year. As stated in section 2.2, under the WM scenario presented in the NAPCP, Croatia is projected to achieve all 2020-29 national commitments. 2030 onwards commitments are projected to be achieved for all pollutants except NH$_3$. For NH$_3$, emissions are projected to increase between 2020 and 2030.

The accompanying report includes a description of uncertainties and sensitivities for the WM and for the WAM scenario. Starting parameters and assumptions for the projections are detailed in Annex 2 of the report. Sensitivities are described in the main body text. For the WM scenario the examined changed parameter is keeping the constant price of EU ETS emission allowances at EUR 15/EUA, instead of this price increasing as in EU Reference Scenario 2016. This can lead to higher emissions for SO$_2$, NO$_x$ and NMVOC as a result of increased operation of fossil fuel thermal power plants. In the case of ozone this is linked to data availability.

---

6 In the case of ozone this is linked to data availability.
SO₂ for 2030 a 4.7 percent higher emission is projected in this scenario, that could endanger compliance. For NOₓ and NMVOC compliance would not be influenced.

The projections presented in the NAPCP were developed in October 2018 and are sufficiently up to date to capture the current PaMs in the WM scenario.

A qualitative description of changes in air quality is provided for zones non-compliant with EU limit and target values in 2015, 2016 and in some cases in 2017. This analysis is based on the information in the air quality action plans. However, the projected degree of future compliance is not explicitly described in the NAPCP, expected years of compliance are not reported.

The descriptions of the air quality action plans point to increasing biomass use in energy production and residential heating that result in increased PM emissions that increases the difficulties in reaching compliance with air quality objectives. Quantitative data is not provided.

### 3.6 Policy options considered to comply with emission reduction commitments for 2020 and 2030, intermediate emission levels for 2025 and stakeholder consultation (M, O)

- Croatia has considered 12 PaMs for adoption. PaMs are grouped in four packages covering agriculture (one package of seven individual PaMs), energy efficiency (one package of one PaM), transport (one package of one PaM) and a cross-cutting package (three individual PaMs).
- The PaMs considered reflect the main emission sources of each pollutant and are coherent with the air quality and climate and energy policies. Expected emission reductions are reported by sector (agriculture, energy efficiency, road transport).
- For nine PaMs, the NAPCP includes a cost and benefit estimation.

#### 3.6.1 Summary of the information reported

The assessment presented in this section is based on the information reported via the EEA PaM-tool. Where relevant, it is complemented with the information from the main body of the NAPCP.

Croatia has considered altogether 12 additional PaMs for adoption. PaMs are reported in four packages. Altogether seven PaMs target the agricultural sector, three PaMs are cross-cutting, one relates to energy efficiency and one to road transport.

The PaMs on agriculture are clear and realistic, they are judged to be reasonable. The three PaMs under the category ‘cross-cutting’ are general measures. The PaMs under energy efficiency and road transport (one for each) are not detailed enough. Their general aims are clear and feasible but from the descriptions their real effects cannot be assessed.

### Agriculture (one package of seven PaMs)

| MAG-1: Changes in livestock nutrition and feed quality |
| MAG-2: Anaerobic decomposition of manure and bio-gas production |
| MAG-3: Improving Livestock facilities and Animal Waste Management System |
| MAG-4: Improving the Methods of Mineral Fertiliser application |
| MAG-5: Hydro-technical interventions and systems of protection against natural disasters |
| MAG-6: Introduction of new cultivars, varieties and species |
| MAG-7: Preparation of the National advisory principles of good agricultural practice in accordance with the Framework principles of good agricultural practice for mitigation of ammonia emissions of the United Nations Economic Commission for Europe from 2014 |
3.6.2 Pollutants targeted and projected emission reductions

The WM emission projections indicate that adoption of further measures is required in order to meet the emission reduction commitment for NH$_3$ in 2030. Furthermore, as commitments are projected to be achieved in 2030 only with a narrow margin for SO$_2$ and NO$_X$, there is also a risk of non-compliance under the WM scenario for these two pollutants. All 12 PaMs are reported to have an impact on NH$_3$ emissions including for road transport and energy efficiency measures although the impacts for these measures is small (5 percent of total emission reductions projected for NH$_3$ in 2030). It is unclear why these measures would lead to a reduction in NH$_3$ emissions unless it has some linkages to control technologies for NO$_X$ which can lead to NH$_3$ slippage e.g. selective catalytic reduction. However, insufficient information is reported to be able to determine if this is the case.

SO$_2$ and NO$_X$ emission reductions are appropriately considered; beside the three cross-cutting measures, SO$_2$ is targeted by two PaMs and NO$_X$ by seven PaMs. NMVOC and PM emission reductions are not specifically targeted by any of the PaMs but the PaMs considered are estimated to have some impact on the emission of these two pollutants as well. From an emission reduction perspective, it is justifiable that PaMs considered are not targeting these two pollutants. However, from an air quality point of view Croatia would clearly benefit from such measures as several zones have compliance issues with PM$_{10}$ and O$_3$ levels, that could get worse because of the trends in biomass use described in section 3.5 of this report.

Additional PaMs considered are estimated to reduce N$_2$O, CO$_2$, CH$_4$ and PM$_{10}$. Among these, quantified emission reductions are reported only for PM$_{10}$. Croatia does not consider PaMs that target BC as a component of PM$_{2.5}$.

Estimated emission reductions in the NAPCP are reported at sector level only and by package of PaMs. The estimated emission reductions reported via the EEA PaM-tool are reported at package level but repeated for each individual PaM within a package and therefore, there is a risk that the information reported via the EEA PaM-tool is mistaken for emission reductions at individual PaM level rather than at package level. The estimated emission reductions are reported consistently in kt/ year. For the year 2020, no quantified emission reductions are reported. However, according to the NAPCP projections
under a WAM scenario (section 2.8 of the NAPCP), Croatia is projecting to achieve further emission reductions under the WAM scenario compared to the WM scenario by 2020. It is unclear from the information presented how Croatia can achieve emission reductions by 2020 with the additional PaMs considered and adopted.

For the three cross-cutting measures projected emission reductions have not been quantified.

The lack of quantified emission reductions is justified in these cases given the nature of the PaMs: they focus on administrative and technical support for monitoring emissions and air quality and so they do not deliver any emission reductions directly.

Table 3-1 presents the total emission reductions estimated for PaMs considered for adoption.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>2020</th>
<th>2025</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>SO₂</td>
<td>0</td>
<td>0.09</td>
<td>0.16</td>
</tr>
<tr>
<td>NOₓ</td>
<td>0</td>
<td>0.97</td>
<td>1.74</td>
</tr>
<tr>
<td>NMVOC</td>
<td>0</td>
<td>2.13</td>
<td>3.57</td>
</tr>
<tr>
<td>NH₃</td>
<td>0</td>
<td>4.70</td>
<td>9.03</td>
</tr>
<tr>
<td>PM₂.₅</td>
<td>0</td>
<td>1.17</td>
<td>2.05</td>
</tr>
</tbody>
</table>

For the year 2020 no quantified emission reductions is projected by Croatia for the PaMs considered for adoption. When comparing the total emission reductions estimated for PaMs considered for adoption (Table 3-1) to the 2005 baseline, the PaMs are estimated to achieve the following emission reductions in 2025 and 2030:

- SO₂: less than 1 percent in 2025 and 2030
- NOₓ: 1 percent in 2025 and 2 percent in 2030
- NMVOC: 2 percent in 2025 and 3 percent in 2030
- NH₃: 11 percent in 2025 and 21 percent in 2030
- PM₂.₅: 3 percent in 2025 and 5 percent in 2030

All 12 PaMs are not included in any of the projection scenarios according to the information reported via the EEA PaM-tool. However, in the NAPCP and in the accompanying document it is clear that all 12 PaMs are adopted and included in the WAM scenario. This discrepancy may be linked to a reporting error. Accordingly, all 12 PaMs should form part of the WAM scenario reported in NAPCP.

3.6.3 Coherence between the PaMs considered and policy priorities

The PaMs are fully coherent with policy priorities described in the NAPCP. The PaMs for agriculture are in line with policy priorities set in Croatia’s rural development programme. Energy efficiency and transport PaMs are aligned with priorities in other relevant policy documents.

The impact of all PaMs on air quality has been taken into account according to the information presented in the NAPCP. In particular, the NAPCP review finds that the PaMs targeting PM₂.₅ and NMVOC emissions are likely to be beneficial to improving air quality in view of the challenges reported.

There is no evidence to suggest that PaMs considered aim to achieve greater reductions than the national emission reduction commitments for the purpose of supporting other policy priorities.
3.6.4 Responsible authorities and timescales for implementation of PaMs considered

A balanced range of policy instruments is presented in the NAPCP and reported via the EEA PaM-tool, including economic, fiscal, regulatory, research, education, information and planning instruments. Seven PaMs are economic instruments and eight are planning instruments. Source-based and voluntary instruments are not considered. The government is the responsible authority level for implementation of all 12 PaMs considered.

Implementation is planned to start in the years 2018, 2019 and 2020 according to the information reported via the EEA PaM-tool. Planned implementation is scheduled to finish in 2025 for one of the PaMs reported for the transport sector, and in 2030 for four other PaMs reported, covering transport and energy efficiency as well as cross-cutting PaMs. The finish year for implementation is not reported for the remaining PaMs presented and it is understood that in these cases, implementation will be an ongoing process. The information reported via the EEA PaM-tool is different to the NAPCP. In the NAPCP (table 2.7.1), planned implementation is as follows: for 11 PaMs the starting date is 2021 and the end year is 2030, and one cross-cutting measure (MCC-3) is indicated to start in 2019 and finish in 2025. This contradicting information makes it difficult to judge if the lack of emission reductions projected for 2020 is consistent and realistic.

3.6.5 Details of the methodology for evaluation and selection of PaMs

For ten PaMs Croatia provided the same description on the methodology for evaluation and selection of PaMs. For two cross-cutting PaMs no description is provided. The text is describing more the approach to projections than the ways to select the PaMs. According to this in the design of the projections, the NUSPCRO model was developed in the software package LEAP (Long Range Energy Alternative Planning System). The integrated NUSPCRO model allowed the calculation of GHG emissions and emission of pollutants and techno-economic indicators that cover all sectors. The output data of the model is structured in accordance with the structure of the emission inventory according to the United Nations Framework Convention on Climate Change and the LRTAP Convention. The 2006 IPCC Guidelines for National GHG Inventories and the 2006 IPCC Guidelines for National GHG Inventories were used as a technical background material. Individual sectoral models were also integrated in the NUSPCRO model.

Although it is reported in the NAPCP that the methodologies for air emission projections are fully integrated with the GHG emission projections, the review of 2019 projections submitted by Croatia under Article 10(2) of the NECD has revealed a lack of consistency in the underlying activity data underpinning air emission and GHG projections.

3.6.6 Estimation of costs and benefits of the individual PaM or package of PaMs considered

Cost-benefit information is presented in the NAPCP only and not reported via the EEA PaM-tool. Of the 12 listed PaMs the NAPCP includes a quantified estimation of costs and benefits for 9 (6 agricultural PaMs and 3 cross-cutting PaMs). Costs and benefits are not presented for PaMs where costs and benefits are incremental at project and regional level.

The total cost of PaMs considered for adoption is estimated by Croatia to be 1,132 million EUR. Costs cover administrative costs and investment costs – the latter being the costlier of the two. In the agricultural package, the PaM reducing the need for nitrogen and mineral fertilisers usage through complex agricultural infrastructure investments (drainage, irrigation etc.) is the most expensive (1,000 million EUR, accounting for 88% of all estimated costs).

From the cross-cutting PaMs, the PaM aiming at the improvement of local authorities’ capacities to implement air quality action plans is the most expensive (5 million EUR, accounting for 0.5% of all estimated costs).
The timescale for the costs and benefits data is only presented for one PaM in the NAPCP. The PaM will provide investment support to improve livestock installations and the total cost presented covers support up to the year 2050. It is not possible to conclude on the timescale associated with the costs reported for the other PaMs, particularly where the implementation period is planned to run indefinitely according to the information reported via the EEA PaM-tool.

3.6.7 Impacts on air quality and the environment of individual PaMs or packages of PaMs considered

Based on the assessment provided under section 2.4.2 of the NAPCP, and as presented in section 3.4.2 of this report O₃, NO₂, PM and BaP in PM present a challenge to air quality in Croatia. PM emissions, NO₂ emissions and O₃ precursors’ emissions (NOₓ, NMVOC) are targeted by the considered PaMs. Croatia has reported in the NAPCP that due to the lack of available data the assessment of the impact of considered PaMs on air quality and on the environment cannot be estimated.

3.7 The policies selected for adoption by sector including timetable for adoption, implementation and review and responsible competent authority (M, O)

- All 12 PaMs have been adopted, targeting relevant pollutants and sectors.
- Indicators for monitoring progress are set for all PaMs.
- The sources of funding for implementation of the PaMs is not presented in the NAPCP.
- Coherence with air quality, climate and energy policy priorities is established for the PaMs adopted.

3.7.1 Assessment of the credibility of the PaMs selected for adoption per sector

All 12 PaMs has been selected for adoption. Therefore, the projected emission reductions equal the ones presented in Table 3-1 and the analysis presented in section 2.6.1 is relevant for all PaMs selected for adoption.

No explanation has been provided by Croatia via the EEA-PaM tool on the choice of selected measures. The NAPCP and the accompanying report do not include any information related to this either. There is no indication that the reported cost and benefit estimations had any direct influence on the selection of PaMs.

The 2025 and 2030 total emission reductions from these PaMs in the cases of NH₃ and PM₂.₅ equal to the difference between emissions under WM and WAM scenarios presented in the NAPCP. For NOₓ and NMVOC the numbers do not fully correspond, while in the case of SO₂ the differences between the emission levels in the WM and the WAM scenario are not justified by the projected quantified emission reductions of the PaMs. Furthermore, as already noted above, the WAM scenario assumes some reduction in emissions already in 2020 which is not consistent with the emissions reductions presented for the PaMs.

Croatia has included in the NAPCP the following indicators to monitor progress with implementation for all the adopted PaMs. These indicators have not been reported via the EEA-PaM tool. Targets for specific years are not reported.
Table 3-2 Indicators to monitor progress with implementation for the adopted PaMs

<table>
<thead>
<tr>
<th>PaM</th>
<th>Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEN-P-1: Integration of the measures to reduce pollutant emissions into planning documents and projects for the energy renovation of buildings</td>
<td>Number of energy renovated houses in the areas where air quality has been affected</td>
</tr>
<tr>
<td>MTR-P-1: Integration of the measures to reduce pollutant emissions into planning documents and projects relating to road transport</td>
<td>Number of electric vehicles in the areas where air quality has been affected</td>
</tr>
<tr>
<td>MAG-1: Change in livestock nutrition and feed quality</td>
<td>Analyses of the quality of livestock feed and feed supplements</td>
</tr>
<tr>
<td>MAG-2: Anaerobic decomposition of manure and biogas production</td>
<td>Share of livestock on digesters</td>
</tr>
<tr>
<td>MAG-3: Improving livestock facilities, systems of animal waste management and methods of organic fertiliser application</td>
<td>Share of livestock (pigs, cattle, poultry) on farms with biofilters, covered lagoons and inside livestock facilities with appropriate microclimate conditions</td>
</tr>
<tr>
<td>MAG-4: Improving the methods of mineral fertiliser application</td>
<td>Quantity of urea and slow-release nitrogen mineral fertilisers applied</td>
</tr>
<tr>
<td>MAG-5: Hydro-technical interventions and systems of protection against natural disasters</td>
<td>Area of the cultivated land with systems of irrigation, drainage and protection against natural disasters</td>
</tr>
<tr>
<td>MAG-6: Introduction of new cultivars, varieties and species</td>
<td>Land area and yields of new cultivars, varieties and crops</td>
</tr>
<tr>
<td>MAG-7: Preparation of the National advisory principles of good agricultural practice</td>
<td>Number of training sessions and number of users</td>
</tr>
<tr>
<td>MCC-1: Support to increase the administrative, technical and management capacities of local communities</td>
<td>Number of workshops held; number of new portals, new promotional materials, number of information campaigns; number of projects submitted for financing under the LIFE programme; number of EPEEF tenders; number of other programmes and funds activated to ensure implementation of the measure</td>
</tr>
<tr>
<td>MCC-2: Preparing supporting documentation to secure additional financial resources for more effective implementation of air quality improvement action plans</td>
<td>Number of projects submitted for financing under the LIFE programme; number of EPEEF tenders; Number of other programmes and funds activated to ensure implementation of the measure</td>
</tr>
<tr>
<td>MCC-3: Support for surveys regarding the planning of PaMs and monitoring of their effects on emissions and air quality</td>
<td>Number of projects</td>
</tr>
</tbody>
</table>

Potential issues with implementation or with changes that would be required in order to implement the PaMs are not presented in the NAPCP. Competent authorities responsible for the implementation of the adopted PaMs are reported for each PaM, these are the relevant ministries in all cases.

The most important PaMs per sector are discussed below.
Agriculture

Croatia considered a total of seven PaMs for the agricultural sector, all seven are included in the projections under the WAM scenario. From the mandatory measures listed in Annex III, Part 2 of the NECD measures under category A1 are adopted through PaMs MAG1-MAG4. In the case of measure A3 (ban on ammonium carbonate fertilisers), Croatia has indicated that this ban already exists in Croatia since 2018.

Two mandatory measures are not selected for adoption from measures listed in Annex III, Part 2 of the NECD:

- Measure B1: ban on burning;
- Measure C: impact on small farms.

In the case of Measure B1 Croatia refers to GAEC 6 (Maintaining the level of organic matter in soil) that is followed, thus burning of harvest residues is prohibited. A ban on burning agricultural waste and forest residues is not referred by Croatia in the NAPCP. In the case of measure C, justification has not been provided.

From the optional measures Croatia has adopted B2, the establishment of a national advisory code of good agricultural practices, with PaM MAG-7. Other optional measures neither adopted nor listed as current PaMs.

On the basis of additional PaMs and current PaMs it can be concluded that Croatia selected for adoption or has already implemented the mandatory measures, except for measure C on small farms, and parts of measure B1 (ban on burning). Furthermore, one optional measure is selected for inclusion in the NAPCP.

Two more PaMs related to agriculture have been reported by Croatia. MAG5 refers to complex agricultural infrastructure investments (drainage, irrigation etc.) leading to NH3 emission reductions by reducing fertiliser use. MAG-6 is targeting the introduction of new cultivars, varieties and species in order to reduce the use of fertilisers, thus reducing NH3 emissions.

The PaMs are clear, their projected emission reductions are realistic and are coherent with the expectations presented in the NAPCP.

Energy consumption

One PaM regarding energy efficiency has been adopted (MEN-P-1 on planning documents and projects for energy renovation of buildings). Although the assumptions behind the measure are clear, the measure is quite broad and details are not provided, therefore it is not possible to assess how realistic the expected effects and quantified reductions are.

Transport

The EEA-PaM tool includes only one PaM selected for adoption related to the transport sector. MTR-P-1 refers to integration of the measures to reduce pollutant emissions into planning documents and projects relating to road transport. Although the assumptions behind the measure are clear, the measure is quite broad and details are not provided, therefore it is not possible to assess how realistic the expected effects and quantified reductions are.

Cross-cutting

In the EEA-PaM tool three adopted PaMs are listed as cross-cutting measure, under the package ‘Support measures to strengthen the administrative, technical and management capacity’. These are

---

7 ‘Good agricultural and environmental conditions’ (GAEC) refers to a set of European Union standards described in Annex III of Council Regulation (EC) No 73/2009 on establishing common rules for direct support schemes for farmers under the common agricultural policy and establishing certain support schemes for farmers) defined at national or regional level, aiming at a sustainable agriculture.
general cross-cutting measures; with a focus on implementation of air quality action plans, monitoring and assessment systems and on promoting research. The assumptions behind the measures are clear, the exact steps planned to be taken includes support to local authorities to obtain funds for these activities. Given the nature of the PaMs, quantified projected emissions are not provided to any of them. Consequently, their potential impacts and their relevance to emission reductions cannot be judged.

3.7.2 Feedback from the consultation undertaken

The NAPCP (in table 2.7.1) does not indicate the views received from consultation. However, the accompanying report to the NAPCP includes a chapter with the description of the stakeholder consultations that were conducted during the preparation of expert background material for the Low-Emission Development Strategy of the Republic of Croatia for the period until 2030 with a view to 2050. Views and comments received in relation to possible measures are not detailed but are available via external links.

3.7.3 Sources of funding

Despite costs of PaMs have been estimated, Croatia has not identified in the NAPCP the sources of funding for the implementation of the PaMs.

3.7.4 Coherence with plans and programmes set up in other relevant policy areas

In the EEA-PaM tool Croatia has not reported any information related to the coherence of the selected PaMs with plans and programmes in other policy areas. In the NAPCP, Croatia has indicated that PaMs are fully coherent with relevant plans and programmes established by virtue of the requirements set out in national legislation and encourage synergy in the preparation and implementation of measures.

It is not presented specifically in the NAPCP that PaMs selected for adoption would aim to achieve greater reductions than the national emission reduction commitments under the NECD. However, it is indicated in the EEA-PaM tool that PaMs will reduce emissions of other pollutants: CH₄ by seven PaMs, CO₂ by seven PaMs, N₂O by six PaMs and PM₁₀ by ten PaMs. Quantified reductions are provided only for PM₁₀ reductions.

The NAPCP does not specifically refer to NECP and coherence between both plans. The review found that measures related to energy efficiency and road transport are more detailed in the draft NECP compared to NAPCP. Except for the PaM on good agricultural practice (MAG-7), the same agricultural PaMs are included in the draft NECP together with other measures related to the rural development programme, capacity buildings and biomass collection. The draft NECP includes measures to decrease solvent use, thus NMVOC emissions, while this is not included in the NAPCP.

3.8 Projected combined impacts of PaMs on emission reductions, air quality and the environment and associated uncertainties (where applicable) (M, O)

3.8.1 Likelihood of achievement of projected emission reductions

According to the projections included in the NAPCP, emission reductions under the WAM scenario for 2020 and 2030 will meet the national emission reduction commitments in the NECD.

As presented in section 2, under the WAM scenario emission reduction commitments are projected to be achieved for all pollutants in the period of 2020-2029 and in 2030 onwards.

Sensitivities related to the WAM scenario are described in the accompanying report (section 8.6). Sensitivity analysis was done for parameters crucial to the electricity system: net electricity import and
price of natural gas. The increase of import and the decrease of gas price both would lead the decreasing pollution as they would result in reduced operation of fossil fuel thermal power plants. However, these would not influence compliance under the WAM scenario.

Conclusions from the NAPCP review on whether the projected emission reductions per pollutant are likely to realise in practice are presented in Table 3-3.

Table 3-3 Likelihood of achieving the projected emissions reductions (WAM scenario)

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Do the PaMs selected for adoption target the key emitting sectors?</th>
<th>Are the projected emission reductions for 2020 and 2030 likely to be achieved?</th>
</tr>
</thead>
<tbody>
<tr>
<td>SO₂</td>
<td><strong>Partly</strong></td>
<td><strong>Partly</strong></td>
</tr>
<tr>
<td></td>
<td>SO₂ emissions are mainly connected to energy production and consumption in Croatia. Among the considered PaMs the energy efficiency package targets SO₂ emissions from non-industrial combustion mainly by reducing energy consumption through increased energy efficiency of buildings. Second and third largest sources, fugitive emission and combustion in industry are not targeted by any specific PaMs.</td>
<td>There is one PaM that clearly targets SO₂ emissions. For 2020, the differences between the emission levels in the WM and the WAM scenario are not justified by the projected quantified emission reductions of the PaMs. Thus, there is some uncertainty related to the achievement of the projected emission reductions.</td>
</tr>
<tr>
<td>NOₓ</td>
<td><strong>Partly</strong></td>
<td><strong>No</strong></td>
</tr>
<tr>
<td></td>
<td>Road transport, energy production and household heating are responsible for the largest share of NOₓ emissions. Energy efficiency and road transport packages are targeting these main sources, however the description of these PaMs do not provide information on what types of measures will be introduced into the planning documents.</td>
<td>The two related PaMs concern integrating measures into planning documents and it is not clear how these PaMs will deliver the projected reductions. Furthermore, the projected quantified emission reductions resulted by the PaMs are not fully in line with the difference between WM and WAM emission levels, that creates uncertainty.</td>
</tr>
<tr>
<td>NMVOC</td>
<td><strong>Partly</strong></td>
<td><strong>No</strong></td>
</tr>
<tr>
<td></td>
<td>As emission reduction commitments are met under the WM scenario, none of the considered PaMs are specifically targeting NMVOC emission sources. Still emission reductions from non-industrial combustion and from transport are targeted by the PaMs considered in the energy efficiency and the transport packages.</td>
<td>The relevant PaMs are not describing specific measures that will be put in place, thus it cannot be assessed whether the emission reductions estimated for these PaMs will be delivered in practice. Furthermore, the projected quantified emission reductions resulted by the PaMs are not fully in line with the difference between WM and WAM emission levels, that creates uncertainty.</td>
</tr>
<tr>
<td>NH₃</td>
<td><strong>Yes</strong></td>
<td><strong>Yes</strong></td>
</tr>
<tr>
<td></td>
<td>Do the PaMs selected for adoption target the key emitting sectors?</td>
<td>Are the projected emission reductions for 2020 and 2030 likely to be achieved?</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>PM$_{2.5}$</strong></td>
<td><strong>Partly</strong></td>
<td>Although the trends under the WM scenario show an increase in the emissions, the projected emission reductions are judged as realistic. The only uncertainty is that the measures are entitled as economic and information ones, so the effectiveness of the implementation is not fully clear.</td>
</tr>
<tr>
<td>In 2016, 53% of NH$_3$ emissions came from plant production and agricultural soils (NFR code 3D) and 31% from animal husbandry and manure management (NFR code 3B). Seven adopted PaMs are targeting agriculture, Three PaMs relate to animal husbandry and manure management and three PaMs to crop production. The seventh PaM aims to develop the national advisory principles of good agricultural practice. The main sources of emissions are appropriately targeted.</td>
<td>No</td>
<td>The relevant PaMs are not describing specific measures that will be put in place, thus it cannot be assessed whether the emission reductions estimated for these PaMs will be delivered in practice.</td>
</tr>
</tbody>
</table>

This analysis of the credibility of the PaMs in achieving emission reductions has also been used in the assessment of the risk of non-compliance, presented in Appendix 2.

3.8.2 Deviation from the linear trajectory for 2025

For all NECD pollutants a linear emission reduction trajectory is followed.

3.8.3 Use of flexibilities

No intention to use the flexibilities permitted by Article 5 of the NECD is reported in the NAPCP.

3.8.4 Projected impacts on air quality and the environment.

The impact of PaMs on air quality have not been modelled, and the NAPCP states that data for such assessment is not available. However, the NAPCP assumes that under the WAM scenario for NO$_2$ there will be no more exceedances (expected year for reaching compliance is not reported), while for PM$_{10}$ and O$_3$ exceedances will remain. In the case of PM$_{10}$, this is a consequence of the high impact of transboundary emissions as well domestic emissions. This would justify additional PaMs to reduce PM emissions, even though national emission reduction commitments are projected to be reached.
4 Conclusions and recommendations

4.1 Conclusions

A draft version of the NAPCP was submitted to the European Commission on 3 April 2019, however, the final NAPCP was submitted on 11 October 2019, after the deadline set in the NECD. The NAPCP follows the structure of the common format established by the Commission Implementing Decision (2018/1522) and the EEA PaM tool was used to report the PaMs considered and selected for adoption. An accompanying report was also submitted that in certain aspects includes additional information beside the tables of the common format and the fields of the EEA PaM tool.

Croatia provides the minimum content required by the common format except in the following cases:

- The contact details of the authority responsible for drafting the programme is not specified in section 2.1 of the NAPCP.
- The inventory year underpinning the projections is not provided in section 2.5.1 and in 2.8.1 either (although on the basis of other reported information it is understood to be 2016).
- The projected degree of compliance with air quality objectives is not made explicit in section 2.5.2.

Reporting via the EEA PaM tool is not fully consistent with the information presented in the NAPCP and in the accompanying report, and more detail is presented in the NAPCP in comparison.

According to the NAPCP projections, Croatia is projecting to achieve all 2020-29 and 2030 commitments for all pollutants under the NECD except for the 2030 NH₃ commitment. As presented in section 2.2 of this report, the conclusions on projected compliance are different according to the review of projections submitted under Article 10(2), which show that the 2030 NH₃ commitment is projected to be achieved under the WM scenario. Under the WAM scenario presented in the NAPCP, Croatia is projected to meet its national emission reduction commitments for all pollutants under the NECD.

The analysis of the additional PaMs shows that the PaM descriptions for packages targeting energy efficiency and road transport are lacking in detail. While their general aims are clear and feasible, the PaM descriptions are brief and the estimated emission reductions are presented by package of PaMs and so the effect cannot be assessed.

NH₃ is the only pollutant for which Croatia is projected to miss its 2030 emission reduction commitment under the WM scenario. Its main source is agriculture (NFR code 3B and 3D). All mandatory agricultural measures listed in Annex III, Part 2 of the NECD that relate to NH₃ emissions are already in place or planned for adoption. A further two PaMs target the reduction of fertiliser use. Overall the main sources are appropriately targeted, and the quantified projected reductions are credible although they are reported only at an aggregated, sectoral level. Around 5% of projected emission reductions of NH₃ in 2030 are estimated to be achieved from energy efficiency and road transport PaMs. However, the description of these PaMs lacks any information on what specific measures will be introduced, thus credibility of these PaMs and projected emission reductions could not be assessed. However, even if the impact of these PaMs on NH₃ emissions is excluded, NH₃ commitments are projected to be achieved under the WAM scenario.

Positive highlights from the review of the NAPCP for Croatia are:

- In the accompanying report, Croatia has provided a detailed description of the existing PaMs that helps understand the trend in emissions and delivers the information required for assessing the additional PaMs.
- Additional PaMs have been adopted targeting all NECD pollutants, which goes beyond the requirements of the NECD as compliance is projected under the WM scenario for SO₂, NOₓ, NMVOC and PM₂.⁵. The estimated emission reductions of the additional PaMs adopted can also contribute to improving compliance with air quality targets. The estimated emission reductions of
PM and NMVOC will support reductions in PM$_{10}$ and O$_3$ concentrations in ambient air which are a challenge in Croatia.

- The information on costs and benefits helps to demonstrate the credibility of the PaMs adopted.
- Additional PaMs presented in the NAPCP are well described and optional content is reported, presenting indicators to evaluate progress.

Based on the analysis in this report and the findings from the projections review that was conducted separately, it can be concluded that non-compliance is not a high risk for Croatia (Appendix 2).

### 4.2 Recommendations

Recommendations are prioritised according to the following categories:

1. **Ensuring compliance** – non-compliance with the NECD, where the minimum content is not reported and/or the Member State does not demonstrate how it may achieve its emission reduction commitments.

2. **Areas for improvement** – the NAPCP is reported to be compliant with its emission reduction commitments and provides the minimum content required by the common format but areas for improvement to strengthen compliance have been identified.

3. **Encouragements** – where optional reporting and/or the NAPCP could be closer aligned with the guidance document on preparation of initial NAPCPs to strengthen the quality of the NAPCP.

#### Ensuring compliance

- A website link to access the NAPCP should be added including the contact details (telephone, email) (section 2.1).
- The inventory year underpinning the projections should be reported in tables 2.5.1 and in table 2.8.1.

#### Areas for improvement

- In the accompanying report Croatia provides information on stakeholder consultation events, but their results are referenced only in external documents. It would be beneficial to add the main conclusions of these consultation events to the NAPCP (section 2.7.1)
- It would be beneficial to add a qualitative description of the projected degree of compliance with EU air quality objectives for NO$_2$, PM$_{10}$, PM$_{2.5}$, O$_3$ and for BaP to section 2.5.1 of the NAPCP.
- Further description of the existing energy efficiency and road transport measures would help to establish coherence between the additional PaMs and those already established within planning documents.

#### Encouragement

- The executive summary could be shortened; the common format suggests a length of ten pages (section 2.2)
- Transboundary effects on SO$_2$, NO$_X$ and NH$_3$ are described in section 2.4.3 of the NAPCP but it is not provided for PM. As Croatia has air quality problems related to PM concentration levels it would be beneficial to have an assessment on this pollutant as well. Furthermore, pie charts illustrating
effects of Croatia’s emission on other countries are illegible. Evidence of a transboundary consultation, if any, could also be added.

- Although from an emission reduction point of view Croatia is compliant with its national commitments, from an air quality point of view it would benefit from measures targeting PM and NMVOC emissions, as several zones have compliance challenges with PM$_{10}$ and O$_3$ levels.

- It would be beneficial to quantify the projected reductions under section 2.6 and 2.7 for the other pollutants for which emission reductions are expected (CH$_4$, CO$_2$, N$_2$O).

- The timescale for the costs and benefits data is only presented for one PaM in the NAPCP. Croatia may want to present information on the timescale associated with the costs reported for the other PaMs, particularly where the implementation period is planned to run indefinitely according to the information reported via the EEA PaM-tool.

- Optional content on indicators presented in section 2.7.1 of the NAPCP could be reported via the EEA PaM tool.
Appendix 1 Completeness assessment

A completeness assessment was conducted to identify gaps in reporting according the minimum content requirements of the common format (Commission Implementing Decision (EU) 2018/1522). The completeness assessment also reviewed the extent of optional reporting by Member States.

For mandatory reporting requirements, the status has been assessed using the traffic light RAG rating as presented in the table below.

**Table A1 - 1 Traffic light RAG rating for completeness assessment of mandatory reporting**

<table>
<thead>
<tr>
<th>RAG Rating</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>No information provided for mandatory reporting requirement</td>
</tr>
<tr>
<td>Amber</td>
<td>Evidence is incomplete or unclear to meet reporting requirement</td>
</tr>
<tr>
<td>Green</td>
<td>Evidence is sufficient to meet reporting requirement</td>
</tr>
<tr>
<td>N/A</td>
<td>Mandatory reporting requirement not relevant for the given Member State or mandatory only when available and not available in the given Member State (e.g. where mandatory reporting requirements apply only where a non-linear emission reduction trajectory is followed)</td>
</tr>
</tbody>
</table>

**Table A1 - 2 Assessment of the NAPCP compliance screening with the minimum content requirements**

<table>
<thead>
<tr>
<th>Reference to the NAPCP common format</th>
<th>RAG Rating</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1 Title of the programme contact information and websites</td>
<td>Amber</td>
<td>The title, Member State and the authority responsible for drafting are specified but contact details are not provided.</td>
</tr>
<tr>
<td>2.3.1 Policy priorities and their relationship to priorities set in other relevant policy areas</td>
<td>Green</td>
<td>Relevant policy priorities are described for air quality, climate and energy, agriculture, industry, transport and waste management. In the accompanying report a coherence assessment has been undertaken for the reporting requirements relevant to the policy priorities described (section 2.2.1 and 2.2.2). The NAPCP also outlines priorities included in national development programmes.</td>
</tr>
<tr>
<td>2.3.2 Responsibilities attributed to national, regional and local authorities</td>
<td>Green</td>
<td>Information concerning the roles and responsibilities of the authorities involved is provided across all levels of governance.</td>
</tr>
<tr>
<td>2.4.1 Progress made by current PaMs in reducing emissions, and the degree of compliance with national and Union emission reduction obligations</td>
<td>Green</td>
<td>Progress in improving air quality is described over a set time series with respect to the degree of compliance achieved with EU air quality standards.</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Reference to the NAPCP common format</th>
<th>RAG Rating</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.4.2 Progress made by current PaMs in improving air quality, and the degree of compliance with national and Union air quality obligations</td>
<td>Green</td>
<td>Progress in improving air quality is described over a set time series with respect to the degree of compliance achieved with EU air quality standards.</td>
</tr>
<tr>
<td>2.4.3 Where relevant, current transboundary impact of national emission sources</td>
<td>Green</td>
<td>The impact of domestic emission sources on neighbouring countries is described in the context of depositions.</td>
</tr>
<tr>
<td>2.5.1 Projected emissions and emission reductions (WM scenario)</td>
<td>Amber</td>
<td>Emissions (kt) and emission reductions (%, compared to a 2005 base year) are reported. The year of the inventory data used to underpin the projections is not provided but based on the information provided it is understood to be 2016.</td>
</tr>
<tr>
<td>2.5.2 Projected impact on improving air quality (WM scenario)</td>
<td>Amber</td>
<td>Brief information on air quality, based on air quality action plans for the relevant zones, is provided for NO\textsubscript{2}, PM\textsubscript{10} and BaP for air quality zones with reported exceedances in 2015, 2016 or 2017, but the projected degree of compliance is not made explicit.</td>
</tr>
<tr>
<td>2.6.1 Details concerning the PaMs considered in order to comply with the emission reduction commitments (reporting at PaM level)</td>
<td>Amber</td>
<td>The minimum content is reported via the EEA PaM-tool. However, there are inconsistencies with the information presented in the NAPCP.</td>
</tr>
<tr>
<td>2.6.2 Impacts on air quality and the environment of individual PaMs or packages of PaMs considered in order to comply with the emission reduction commitments (where available)</td>
<td>N/A</td>
<td>Croatia has indicated due to lack of available data the assessment of the impacts of considered PaMs on air quality cannot be fulfilled.</td>
</tr>
<tr>
<td>2.6.4 Additional details concerning the measures from Annex III Part 2 to Directive (EU) 2016/2284 targeting the agricultural sector to comply with the emission reduction commitments</td>
<td>Green</td>
<td>The minimum content is reported via the EEA PaM-tool.</td>
</tr>
<tr>
<td>2.7.1 Individual PaMs or package of PaMs selected for adoption and the competent authorities responsible</td>
<td>Green</td>
<td>The minimum content is reported via the EEA PaM-tool.</td>
</tr>
<tr>
<td>2.7.2 Assessment of how selected PaMs ensure coherence with plans and programmes set up in other relevant policy areas</td>
<td>Green</td>
<td>A summary of the coherence assessment undertaken for the selected PaMs is presented in the NAPCP.</td>
</tr>
<tr>
<td>2.8.1 Projected attainment of emission reduction commitments (WAM)</td>
<td>Amber</td>
<td>Emissions (kt) and emission reductions (%, compared to a 2005 base year) are reported.</td>
</tr>
</tbody>
</table>
The rating used for the completeness assessment of optional reporting by Member States refers to only two categories, whereby the Member State either reported the information (Green) or it did not (White). This rating reflects the fact that the reporting is optional and therefore where the information was not provided, or where it was incomplete or unclear, the assessment should not consider this a gap in reporting.

**Table A1 - 3 Rating for completeness assessment rating of optional reporting**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green</td>
<td>Evidence is sufficient to meet reporting requirement</td>
</tr>
<tr>
<td>White</td>
<td>No information provided for optional reporting requirement or evidence is complete or unclear to meet optional reporting requirement</td>
</tr>
</tbody>
</table>

**Table A1 - 4 Completeness assessment of the NAPCP for the optional content requirements**

<table>
<thead>
<tr>
<th>Reference to the NAPCP common format</th>
<th>RAG Rating</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Executive summary</td>
<td>Green</td>
<td>Croatia has reported the optional content specified by the common format of the NAPCP, an executive summary is provided in the NAPCP.</td>
</tr>
<tr>
<td>2.3.1 Policy priorities and their relationship to priorities set in other relevant policy areas: Reference to WHO guideline values</td>
<td>White</td>
<td>No reference to the WHO guideline values is made with regards to the air quality priorities described.</td>
</tr>
<tr>
<td>2.3.2 Responsibilities attributed to national, regional and local authorities: Source sectors under the responsibility of the authority</td>
<td>White</td>
<td>The source sectors under the responsibility of the authorities are not provided.</td>
</tr>
<tr>
<td>2.4.1 Progress made by current PaMs in reducing emissions, and the degree of compliance with national and Union emission reduction obligations: Provision of graphics</td>
<td>Green</td>
<td>Graphics to illustrate the emission reductions achieved by the current PaMs are provided.</td>
</tr>
<tr>
<td>2.4.2 Progress made by current PaMs in improving air quality, and the degree of compliance with national and Union air</td>
<td>Green</td>
<td>Maps are provided to show concentrations of air quality pollutants for the year 2015 and a description is provided with regards to a</td>
</tr>
<tr>
<td>Reference to the NAPCP common format</td>
<td>RAG Rating</td>
<td>Explanation</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>quality obligations: Provision of graphics and progress made in a specific air quality zone</td>
<td>Green</td>
<td>specific air quality zone where problems have been identified for PM$_{10}$.</td>
</tr>
<tr>
<td>2.4.3 Methodologies and data used to show the current transboundary impact of national emission sources</td>
<td>Green</td>
<td>Data and the methodology used are described.</td>
</tr>
<tr>
<td>2.5.1 Associated uncertainties of the projected emissions and emission reductions (WM scenario)</td>
<td>Green</td>
<td>The associated uncertainties are described for each NECD pollutant and in the ‘accompanying report’ a sensitivity analysis is also provided (section 4.1.2).</td>
</tr>
<tr>
<td>2.5.2 Quantitative data on the projected impact on improving air quality (WM scenario)</td>
<td>White</td>
<td>Quantitative data is not provided.</td>
</tr>
<tr>
<td>2.6.1 Details about additional pollutants concerning the PaMs considered in order to comply with the emission reduction commitments: Reporting of affected pollutant(s) beyond the scope of the NECD</td>
<td>Green</td>
<td>Additional PaMs considered are estimated to reduce N$_2$O, CO$<em>2$, CH$<em>4$ and PM$</em>{10}$. Quantified emission reductions are only reported for PM$</em>{10}$.</td>
</tr>
<tr>
<td>2.6.3 Estimation of costs and benefits of the individual PaM or package of PaMs considered in order to comply with the emission reduction commitments</td>
<td>Green</td>
<td>Costs and benefits are reported. The cost benefit ratio is reported for certain PaMs.</td>
</tr>
<tr>
<td>2.6.4 Additional details concerning the optional measures from Annex III Part 2 to Directive (EU) 2016/2284 targeting the agricultural sector to comply with the emission reduction commitments</td>
<td>White</td>
<td>Optional measures in Annex III, Part 2 to the NECD relating to agriculture will not be established.</td>
</tr>
<tr>
<td>2.7.1 Individual PaMs or package of PaMs selected for adoption and the competent authorities responsible: Reporting of relevant comments arising from the consultation and provision of interim targets and indicators</td>
<td>Green</td>
<td>The interim targets and indicators are reported. Results from the public consultation were not available at the time of the NAPCP submission.</td>
</tr>
<tr>
<td>2.7.2 Explanation of the choice of selected measures</td>
<td>White</td>
<td>All PaMs considered are selected and so no explanation is provided.</td>
</tr>
<tr>
<td>2.8.4 Projected improvement in air quality (WAM)</td>
<td>Green</td>
<td>Projected improvements in air quality are reported as being not available. A short qualitative description is nonetheless provided for NO$<em>2$, PM$</em>{10}$, PM$_{2.5}$, and O$_3$.</td>
</tr>
<tr>
<td>Reference to the NAPCP common format</td>
<td>RAG Rating</td>
<td>Explanation</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>------------</td>
<td>-------------</td>
</tr>
<tr>
<td>2.8.5 Projected impacts on the environment (WAM)</td>
<td>White</td>
<td>Projected impacts on the environment are not reported.</td>
</tr>
</tbody>
</table>
Appendix 2 Assessment of the risk of non-compliance

The description of the methodology used for this assessment is presented in the Horizontal Report.

In the following tables, the information used in the decision tree process is presented in black font. Information not used in the decision tree process is presented in grey font and italics.

Where information is required but not reported, the response to the decision tree question is ‘not reported’ (NR). Where information is not required and not reported, the response to the decision tree question is ‘not applicable’ (n/a).

**Risk of non-compliance with 2020-2029 emission reduction commitments**

<table>
<thead>
<tr>
<th>Decision tree question</th>
<th>Relevant scenario</th>
<th>2020 – 2029</th>
<th>SO₂</th>
<th>NOₓ</th>
<th>NMVOC</th>
<th>NH₃</th>
<th>PM₂.₅</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can the Member State achieve the emission reduction commitments? (projections submitted under Article 10(2))</td>
<td>WM</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>WAM</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Are the projections submitted under Article 10(2) considered to be of good quality?</td>
<td>WM, WAM</td>
<td>Partially</td>
<td>Partially</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Are the NAPCP projections consistent with the latest projections submitted under Article 10(2)?</td>
<td>WM</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>WAM</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Does the NAPCP present credible additional PaMs selected for adoption?</td>
<td>WAM</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Is the margin of compliance (percent of the compliance threshold) likely to ensure compliance with the emission reduction commitments? (projections submitted under Article 10(2))</td>
<td>WM</td>
<td>Yes (62)</td>
<td>Yes (25)</td>
<td>Yes (26)</td>
<td>Yes (29)</td>
<td>Yes (45)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WAM</td>
<td>Yes (72)</td>
<td>Yes (25)</td>
<td>Yes (28)</td>
<td>Yes (31)</td>
<td>Yes (45)</td>
<td></td>
</tr>
<tr>
<td>Risk of non-compliance</td>
<td></td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td></td>
</tr>
</tbody>
</table>

**Additional comments on high risk scores**

The review has concluded that Croatia is not at a high risk of missing any emission reduction commitments for 2020-2029. Despite major improvements recommended to the projection’s methodologies for NMVOC, NH₃ and PM₂.₅, there is a large margin of compliance projected which is judged to reduce the risk of non-compliance.
### Risk of non-compliance with 2030 emission reduction commitments

<table>
<thead>
<tr>
<th>Decision tree question</th>
<th>Relevant scenario</th>
<th>2030 onwards</th>
<th>SO\textsubscript{2}</th>
<th>NO\textsubscript{x}</th>
<th>NMVOC</th>
<th>NH\textsubscript{3}</th>
<th>PM\textsubscript{2.5}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Can the Member State achieve the emission reduction commitments? (projections submitted under Article 10(2))</td>
<td>WM</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>WAM</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Are the projections submitted under Article 10(2) considered to be of good quality?</td>
<td>WM, WAM</td>
<td>Partially</td>
<td>Partially</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Are the NAPCP projections consistent with the latest projections submitted under Article 10(2)?</td>
<td>WM</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>WAM</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Does the NAPCP present credible additional PaMs selected for adoption?</td>
<td>WAM</td>
<td>Partially</td>
<td>No</td>
<td>No</td>
<td>Partially</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Is the margin of compliance (percent of the compliance threshold) likely to ensure compliance with the emission reduction commitments? (projections submitted under Article 10(2))</td>
<td>WM</td>
<td>Yes (6)</td>
<td>No (2)</td>
<td>No (14)</td>
<td>No (0)</td>
<td>No (16)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>WAM</td>
<td>Yes (35)</td>
<td>Yes (10)</td>
<td>Yes (25)</td>
<td>Yes (25)</td>
<td>Yes (28)</td>
<td></td>
</tr>
</tbody>
</table>

| Risk of non-compliance | L | L | M | M | M |

**Additional comments on high risk scores**

The review has concluded that Croatia is not at a high risk of missing any emission reduction commitments for 2030. As is reported in relation to the 2020-29 emission reduction commitments, there is a large margin of compliance projected which is judged to reduce the risk of non-compliance.