

# Final Review Report 2024

Review of National Air Pollutant Emission Inventory Data 2024 under Directive (EU) 2016/2284 (National Emission reduction Commitments Directive) Service Contract No. 09.0202/2023/903481/SER/ENV.C.3

## Germany

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## Abbreviations

AD	Activity data
BaP	Benzo[a]pyrene
BC	Black Carbon
C	Confidential
Cd	Cadmium
CLRTAP	Convention on Long-range Transboundary Air Pollution: the first international treaty to deal with air pollution on a broad regional basis signed by the UNECE in 1979 – ‘the Air Convention’
CO	Carbon Monoxide
E-PRTR	European Pollutant Release and Transfer Register
EC	European Commission
EEA	European Environment Agency
EF	Emission factor
EIONET	European Environment Information and Observation Network
EMEP	The co-operative programme for monitoring and evaluation of the long-range transmission of air pollutants in Europe (unofficially 'European Monitoring and Evaluation Programme' = EMEP)
EMRT-NECD	EEA Emission Review Tool (EMRT) for the National Emission reduction Commitments Directive (NECD)
ERC	Emission Reduction Commitment
EU	European Union
GHG	Greenhouse gas
HCB	Hexachlorobenzene
Hg	Mercury
HM	Heavy metals
IEF	Implied emission factor
kt	Kilotonnes
NA	Not applicable
NECD	National Emission reduction Commitments Directive
NFR	Nomenclature for reporting
NH <sub>3</sub>	Ammonia
NMVOC	Non-methane volatile organic compounds
NO <sub>x</sub>	Nitrogen oxides
NR	Not relevant
PAHs	Polycyclic aromatic hydrocarbons
Pb	Lead
PCB	Polychlorinated biphenyls
PCDD/F	Polychlorinated dibenzo-p-dioxins and dibenzofurans

PM <sub>10</sub>	Fine particulate matter: particles with an aerodynamic diameter equal to or less than 10 micrometres (µm)
PM <sub>2.5</sub>	Fine particulate matter: particles with an aerodynamic diameter equal to or less than 2.5 micrometres (µm)
POPs	Persistent organic pollutants
PTC	Potential technical correction
RE	Revised estimate
SO <sub>2</sub>	Sulphur dioxide
SO <sub>x</sub>	Sulphur oxides
TC	Technical correction
TERT	Technical expert review team
TSP	Total suspended particulates
UPTC	Unquantified potential technical correction

## I. Introduction

1. The review of the air pollutant emission data submitted by Member States under the European Union's National Emission reduction Commitments Directive (Directive (EU) 2016/2284<sup>1</sup>) is established in Article 10(3):

*"The Commission, assisted by the European Environment Agency and in consultation with the Member States concerned, shall review the national emission inventory data in the first year of reporting and regularly thereafter. That review shall involve the following:*

*(a) checks to verify the transparency, accuracy, consistency, comparability and completeness of information submitted;*

*(b) checks to identify cases where inventory data is prepared in a manner which is inconsistent with the requirements set out under international law, in particular under the LRTAP Convention;*

*(c) where appropriate, calculation of the resulting technical corrections necessary, in consultation with the Member State concerned.*

*Where the Member State concerned and the Commission are unable to reach an agreement on the necessity or on the content of the technical corrections pursuant to point (c), the Commission shall adopt a decision laying down the technical corrections to be applied by the Member State concerned."*

2. The technical review of the National Emission reduction Commitments Directive (NECD) inventories in 2024 (hereafter referred to as the '2024 NECD inventory review') was undertaken in accordance with the NECD air emission inventory review guidelines established at the beginning of the project.

## II. Objectives of the review

3. The general objective of the technical review of Member States' NECD inventories as reported in February 2024 (and resubmitted before 15 March 2024) is to provide recommendations to drive improvements of transparency, consistency, comparability, completeness and accuracy of information submitted. As such the review will contribute to establishing accurate, reliable and verified emission inventories for all Member States, which will also be used for compliance checks with article 4.1 of the NEC Directive.

4. The specific objectives of the 2024 NECD inventory review were:

- A review to verify that Member States have integrated all of the open recommendations, unquantified potential technical corrections, technical corrections

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<sup>1</sup> Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC

and revised estimates for the pollutants<sup>2</sup> NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> identified in the previous NECD inventory reviews<sup>3</sup>.

- An in-depth review of national emission inventories for pollutants for which the Member State reported emissions in previous years or in 2024 that did not comply with the applicable emission reduction commitments.
- A review of the recalculations between the 2023 and 2024 national inventory submissions for the pollutants NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> for the years 2005, 2020 and 2021.
- A review of the time series consistency with a special focus on the years 2005, 2020, 2021 and 2022 for the pollutants: NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub><sup>4</sup>.
- In accordance with the requirements of the NECD (Article 5 and Annex IV) and in line with the “Technical guidance for Parties making adjustment applications and for the expert review of adjustment applications (ECE/EB.Air/130)”<sup>5</sup> and the technical guidance on “Inventory adjustments in the context of emission reduction commitments”<sup>6</sup>, an expert review of:
  - i. All flexibility applications as detailed in Article 5 of the NECD, including an assessment whether the conditions listed in Article 5 were fulfilled.
  - ii. In particular, for adjustment applications, the review of the supporting documentation as requested in part 4 of Annex IV to the NECD and an assessment of whether the adjustment application is consistent with the circumstances described therein.
- A comparison of the reviewed national totals for compliance, for each pollutant, with the maximum allowed emission levels calculated on the basis of the national emission reduction commitments set out in the NECD.

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<sup>2</sup> Recommendations initially raised in previous review years that cover pollutants to be reviewed as part of the 2024 NECD inventory review (main pollutants and PM<sub>10</sub>) **and** recommendations that cover any other pollutant previously reviewed under the NECD inventory review (BC, CO, BaP, PAHs, PCBs, HCB, Cd, Hg, Pb, PCDD/F) and that are of significance to the emission estimates of main pollutants or PM<sub>10</sub> will be included in the 2024 NECD review. This means that Member States might receive follow-up questions in relation to HMs, POPs, BC and CO in cases where observations also relate to a pollutant subject to the 2024 NECD inventory review.

<sup>3</sup> NECD inventory review reports from previous years are available at [https://environment.ec.europa.eu/topics/air/reducing-emissions-air-pollutants/emissions-inventories\\_en#review-of-national-emission-inventories](https://environment.ec.europa.eu/topics/air/reducing-emissions-air-pollutants/emissions-inventories_en#review-of-national-emission-inventories)

<sup>4</sup> Checking whether the 2005 emission value is a high outlier within the 2000-2010 time series. Checking if there is a factor of 2 difference for pollutant emissions between 2020/2021 and 2021/2022 for the top 10 sectors for a Member State and across all Member States. Note that the aviation subsectors are excluded from the check between 2019/2020, 2020/2021 and 2021/2022 as they have been severely impacted by the effects of Covid-19.

<sup>5</sup> Available at [https://www.ceip.at/fileadmin/inhalte/ceip/4\\_adjustments/ece\\_eb\\_air\\_130\\_av\\_for\\_the\\_web.pdf](https://www.ceip.at/fileadmin/inhalte/ceip/4_adjustments/ece_eb_air_130_av_for_the_web.pdf)

<sup>6</sup> Available at [https://www.ceip.at/fileadmin/inhalte/ceip/00\\_pdf\\_other/2022/technical\\_guidance\\_for\\_erc\\_adjustments\\_issue\\_1.1.pdf](https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2022/technical_guidance_for_erc_adjustments_issue_1.1.pdf)

### III. Review approach, team and scope

5. The scope of the 2024 NECD inventory review is summarised in Table 1.

**Table 1: Scope of the 2024 NECD inventory review (under Directive (EU) 2016/2284)**

Element	Scope	Further information
Geographical coverage	EU geographical coverage of the Member States as of 1 January 2024	Includes the geographical territory of the Member States, their exclusive economic zones and pollution control zones. Excludes the Canary Islands, the French overseas departments, Madeira, and the Azores, as per Article 2 of the NECD.
Years	2005, 2020-2022	In addition, time series consistency for 2005 and between the years 2020 - 2021 and 2021 - 2022 was reviewed.
Pollutants	Main pollutants NO <sub>x</sub> , NMVOC, SO <sub>2</sub> , NH <sub>3</sub> , PM <sub>2.5</sub> , and PM <sub>10</sub>	For pollutants for which the Member State reported emissions in previous years or in 2024 that did not comply with the applicable emission reduction commitments, an in-depth review was performed. For 'compliant' pollutants, a review to verify that Member States have integrated all open findings identified in the previous NECD inventory reviews was performed.
Categories	All NFR categories, including selected memo items	All NFR categories that contribute to the national total, and the national total itself, shall be considered. The following memo items shall also be included: 1A3ai(ii) International aviation cruise (civil) 1A3aii(ii) Domestic aviation cruise (civil) 1A3di(i) International maritime navigation 1A3 Transport (fuel used) – where it is used for compliance purposes
National totals	National total and national total for compliance	Rows 141 and 154 in Annex 1 of reporting guidelines

6. The review was split into two phases:

- a) **Initial checks** were carried out by the project team. Significant findings from the initial checks that were not resolved within the initial checks phase were followed up by the technical expert review team (TERT) during the desk review and centralised review.
- b) **A desk review and centralised review** were performed by the TERT. The TERT consisted of the following experts:
  - **Lead Reviewers:** Anne Misra, Ole-Kenneth Nielson
  - **Energy:** Robert Stewart, Stephan Poupa
  - **Transport:** Giannis Papadimitriou, Susana Lopez Aparicio
  - **IPPU:** Rianne Dröge, IIs Moorkens
  - **Agriculture:** Olga Gavrilova, Etienne Matthias, Simone Mayer
  - **Waste:** Dirk Wever, Richard Claxton

This year, the review started with a desk review of the NECD submissions for SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>2.5</sub>, NH<sub>3</sub>, NMVOC and PM<sub>10</sub> and of flexibility applications under Article 5 of the NECD, which lasted for 4.5 weeks. Member States then had two weeks to reply to questions from the desk review. After this, the centralised review took place for one week, during which the TERT could send follow-up questions to Member States.

7. The desk review and centralised review were coordinated by the project team (led by Sabine Schindlbacher and Chris Dore).
8. The EEA Review Secretariat led by Agnieszka Griffin supported the 2024 NECD inventory review.
9. The review was performed on the basis of NECD emission data officially reported by Germany by 15 February 2024 for emission inventories. The Informative Inventory Reports (IIR) reported by 15 March 2024 under the NECD informed the review. Resubmissions and other additional information officially submitted by Member States were taken into account until 19 April 2024.
10. To avoid any potential conflicts of interest, the lead reviewers and sector experts did not review emission inventories of Member States where these individuals had themselves contributed to the compilation of that inventory, or presently are or have been part of the decision-making process related to the compilation of that inventory. Reviewers who are nationals of the Member State whose inventory is concerned, did not act as main sector expert for this Member State.
11. All sector experts signed confidentiality agreements in which they agreed to keep information received by Member States confidential.
12. Definitions for findings included in the Final Review Report can be found in Table 2.

**Table 2: Definitions for finding classifications of the 2024 NECD inventory review.**

Recommendation	A finding where an identified issue with an expected impact below the threshold of significance has not been resolved during the course of the review.
Revised estimate (RE)	A finding for which a Member State provided new estimates in response to an issue raised by the technical expert review team during the course of the review.
Unquantified potential technical correction (UPTC)	A finding for which quantifying a technical correction is currently not possible for the TERT. This is for cases where the expected impact is likely to exceed the determined thresholds of significance, but it is not possible to quantify the technical correction as part of the review. Situations where this may arise include but are not limited to situations where Tier 1 methods are used to make emission estimates for a key category <sup>7</sup> .
Technical correction (TC)	Issued by the TERT for findings identified which result in an over- or under-estimate of more than a 0.5% of the national total in one of the reported years under review and where Member States did not provide a revised estimate which was accepted by the TERT.

<sup>7</sup> UPTCs were used in NECD inventory reviews prior to 2022. In the 2022 NECD inventory review, the TERT did not assign any issues as unquantified technical correction, but labelled issues for which uncertainty was too high and a quantification was not possible as recommendation. UPTCs have been used again since the 2023 NECD inventory review in order to clearly label issues where the TERT has not been able to quantify a potential technical correction.

#### IV. Overall assessment of the quality of the submissions

13. Germany is compliant with all emission reduction commitments and therefore no pollutants were subject to an in-depth review in 2024.
14. Based on the review of the 2024 inventory submission and the 2024 IIR, the TERT considers that there is no indication that the overall assessment of the quality of the submission made in the 2023 NECD inventory review has changed. In 2023, the TERT considered the inventory submission to be of good quality in terms of completeness and accuracy. The IIR submitted in 2023 described the methods transparently, but improvements could be made related to the solvent use categories. A full detailed review for all pollutants with accompanying quality assessment will be conducted in the 2025 NECD inventory review.
15. The TERT acknowledges that the following previous findings for improving the quality of the submissions were implemented by Germany:
  - calculate missing emissions for sources even if the emissions are expected to be small and even for memo items, e.g. recommendation DE-3B4h-2022-0001;
  - improve the transparency of the IIR by providing detailed information on activity data and allocations, e.g. recommendations DE-2D-2023-0001 and DE-2D3i-2023-0001.
16. The TERT emphasises the following findings for improving the quality of the submissions from Germany:
  - improve completeness by calculating missing emissions for sources even if the emissions are expected to be small, e.g. recommendation DE-2D3c-2022-0001;
  - further improve the transparency of the IIR by providing detailed information on activity data and allocations, e.g. recommendations DE-1A3di(i)-2023-0002, DE-2D3a-2023-0001 and DE-2D3e-2023-0001.
17. The TERT considers that it received responses from Germany that were sufficient in order to undertake the 2024 NECD inventory review.

## V. Findings and Conclusions from the TERT for the in-depth review of national emission inventories for NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>

18. The TERT assessed the implementation of all findings from the 2023 NECD inventory review.
19. The TERT carried out in-depth checks to verify the transparency, accuracy, consistency, comparability and completeness of the main pollutants and PM<sub>10</sub> inventory for pollutants for which the Member State reported, in previous years or in 2024, emissions that did not comply with the applicable emission reduction commitments. The focus was on the years 2005 and 2020 to 2022.
20. The assessment was based on the emission inventory submitted in 2024 by Germany pursuant to Directive (EU) 2016/2284 and on the German review report from the 2023 NECD inventory review.
21. Resubmissions and other additional information provided by Member States during the review were taken into account until 19 April 2024.
22. Table 3 gives an overview of the number of recommendations, revised estimates and technical corrections for NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub> that are described in detail in Table 4.
23. Table 4 provides all the findings from the TERT related to NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>, including those additionally made during the 2024 NECD inventory review and those not implemented from the 2023 NECD inventory review. The implementation of the recommendations will be followed up in the 2025 NECD inventory review. The findings are presented in the following order (TC, RE, UPTC, recommendation); within each of these groups, findings are listed by order of NFR code.

**Table 3: Overview of the number of findings included in the 2024 NECD inventory review report related to NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub><sup>8</sup>**

	TC*	RE*	UPTC*	Recommendation
<b>Number of findings included in the 2024 Review Report (see Table 4 below)</b>	0	0	0	4
<b>Out of which new findings resulting from the 2024 NECD inventory review</b>	0	0	0	0

\* TC = technical correction, RE = revised estimate, UPTC = unquantified potential technical correction

<sup>8</sup> The numbers here represent the sum of findings originally issued in previous years and not yet implemented and of new findings first issued as part of the 2024 NECD inventory review.

**Table 4: All findings for NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub>, PM<sub>2.5</sub> and PM<sub>10</sub>, including those made during the 2024 NECD inventory review and those not implemented from the 2023 NECD inventory review**

Review year of initial recommendation (number of years it has been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC in 2023	RE, TC, or UPTC in 2024
2023 (2)	DE-1A3di(i)-2023-0002	No	1A3di(i) International maritime navigation - Memo Item, PM <sub>2.5</sub> , 2005	No	No
<p><b>Assessment of the implementation of the initial recommendation</b></p> <p>For category 1A3di(i) International maritime navigation, PM<sub>2.5</sub>, and year 2005, the IEF for PM<sub>2.5</sub>, where natural gas has been excluded from the activity, is much higher when compared to the other Member States for the same year (PM<sub>2.5</sub> IEF for 2005 = 0.00054 kt/TJ, whereas the upper bound estimated as the mean + 2 std deviations of the IEFs across the Member States is 0.00033 kt/TJ). This was raised during the 2023 NECD inventory review. In response to a question raised during the review, Germany stated that they had planned to revise the model to estimate emissions from international maritime navigation prior to the 2024 submission. However, and due to lack of resources, the model revision had to be postponed. Germany also added that they expect that the model revision will take place before the next submission.</p> <p><b>The TERT reiterates the recommendation that Germany revise the AIS-model behind international maritime navigation, and specifically the 2005 IEF for PM<sub>2.5</sub>, for the next submission.</b></p>					
Review year of initial recommendation (number of years it has been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC in 2023	RE, TC, or UPTC in 2024
2023 (2)	DE-2D3a-2023-0001	Yes	2D3a Domestic solvent use including fungicides, NMVOC, 1990-2022	No	No
<p><b>Assessment of the implementation of the initial recommendation</b></p> <p>For 2D3a Domestic solvent use including fungicides and NMVOC for all years, the TERT notes that there is a lack of transparency regarding reporting of NMVOC emissions for household disinfectant products and hand sanitizers in the IIR. This does not relate to an over- or under-estimate of emissions. This was raised during the 2023 NECD inventory review. The TERT notes that the IIR states that the issue has been included in the list of improvements but it is not stated when the recommendation will be addressed.</p> <p><b>The TERT reiterates the recommendation that Germany include this information in the IIR for the next submission.</b></p>					

Review year of initial recommendation (number of years it has been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC in 2023	RE, TC, or UPTC in 2024
2022 (3)	DE-2D3c-2022-0001	No	2D3c Asphalt roofing, PM <sub>2.5</sub> , PM <sub>10</sub> , 1990-2022	No	No
<p><b>Assessment of the implementation of the initial recommendation</b></p> <p>For 2D3c Asphalt roofing and particulate matter for all years, the TERT notes that Germany uses the notation key 'NA' (not applicable) whilst a Tier 1 method is available in the 2019 EMEP/EEA Guidebook. Hence, there may be an under-estimation of emissions. This was raised during the 2022 and 2023 NECD inventory review. Germany included in its IIR more information under planned improvements for this category and concludes that it will further check industrial information and that it has changed the notation keys to 'NE' (not estimated) for the time being. The latter has been checked by the TERT and in the NFR tables still the notation key 'NA' (not applicable) is used.</p> <p><b>The TERT reiterates the recommendation that Germany include an emission estimate, and until this is possible, change the notation key and provide a justification in the next IIR submission.</b></p>					
Review year of initial recommendation (number of years it has been recommended)	Observation	Key Category	NFR, Pollutant(s), Year(s)	RE, TC in 2023	RE, TC, or UPTC in 2024
2023 (2)	DE-2D3e-2023-0001	Yes	2D3e Degreasing, NMVOC, 1990-1993	No	No
<p><b>Assessment of the implementation of the initial recommendation</b></p> <p>For 2D3e Degreasing and NMVOC for 1990-1993, the TERT noted that there was a lack of transparency regarding the rough expert estimate. This does not relate to an over- or under-estimate of emissions. This was raised during the 2023 NECD inventory review. In response to a question raised during the review, Germany explained that it is not sure that using surrogate data for a more realistic estimate, such as industrial GDP, is suitable for the trend description and whether it allows a consistent trend description.</p> <p><b>The TERT recommends that Germany include in its next IIR a clear description on how the rough expert estimates have been derived.</b></p>					

## VI. Effect of revised estimates and technical corrections on the national total and national total for compliance

24. The tables below show the changes to the national totals and national totals for compliance resulting from the 2024 NECD inventory review. These changes include all revised estimates and technical corrections. The tables also show the impact that these changes have on the reported national total (row 141, Annex I) and national total for compliance (row 154, Annex I).

25. For the years 2020, 2021 and 2022, the national emission reduction commitments 2020 to 2029, as set out in Directive (EU) 2016/2284, have been applied to the 2005 emissions to express the maximum allowed emission per annum in absolute numbers in order to allow for a comparison with the national total for compliance. 2005 emissions ( $E_{2005}$ ) reported in the 2024 inventory submission after taking into account any technical corrections and revised estimates were used for the calculation. The emission reduction commitment for 2020 to 2029 from the NECD was applied to  $E_{2005}$ , which gives the maximum allowed emission per year ( $MaxE_{p.a.}$ ). If the national total reported for a given year and after taking into account any technical corrections and revised estimates is smaller than  $MaxE_{p.a.}$ , then compliance in that year is considered achieved.

**Table 5: National totals for compliance as reported and, where relevant, national totals for compliance<sup>9</sup> including revised estimates (RE) and technical corrections (TC) for NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and maximum national allowed emissions calculated on the basis of the national emission reduction commitments<sup>10</sup>**

Description	Reference	Pollutant estimates (kt)			
		2005	2020	2021	2022
<b>NO<sub>x</sub></b>					
National total (row 141)	Annex I, 14/02/2024	1,598.757	982.824	965.106	941.989
National total for compliance (row 154)	Annex I, 14/02/2024	1,478.365	872.454	859.491	840.861
Maximum allowed emissions stemming from the National Emission Reduction Commitments		-	901.803	901.803	901.803
<b>NMVOC</b>					
National total (row 141)	Annex I, 14/02/2024	1,476.860	1,021.899	1,042.871	1,034.514
National total for compliance (row 154)	Annex I, 14/02/2024	1,167.043	725.706	751.868	747.417
Maximum allowed emissions stemming from the National Emission Reduction Commitments		-	1,015.327	1,015.327	1,015.327
<b>SO<sub>2</sub></b>					
National total (row 141)	Annex I, 14/02/2024	471.602	242.187	250.356	255.441
National total for compliance (row 154)	Annex I, 14/02/2024	471.602	242.187	250.356	255.441
Maximum allowed emissions stemming from the National Emission Reduction Commitments		-	372.566	372.566	372.566
<b>NH<sub>3</sub></b>					
National total (row 141)	Annex I, 14/02/2024	626.705	541.603	525.482	512.222
National total for compliance (row 154)	Annex I, 14/02/2024	626.705	541.603	525.482	512.222
Maximum allowed emissions stemming from the National Emission Reduction Commitments		-	595.369	595.369	595.369
<b>PM<sub>2.5</sub></b>					
National total (row 141)	Annex I, 14/02/2024	133.330	80.779	82.980	84.291
National total for compliance (row 154)	Annex I, 14/02/2024	133.330	80.779	82.980	84.291

<sup>9</sup> The national total for compliance is based on fuel sold data. For NMVOC and NO<sub>x</sub>, emissions from agriculture (3B and 3D) were subtracted from the national total.

<sup>10</sup> The tables presented in this report show numbers rounded to three decimal places for presentation purposes. However, for all calculations, all available decimal places were used. Therefore, a calculation undertaken with the data with three decimal places shown in this table may lead to slightly different results than from the calculations undertaken with the precise data used for the assessment.

Description	Reference	Pollutant estimates (kt)			
		2005	2020	2021	2022
Maximum allowed emissions stemming from the National Emission Reduction Commitments		-	98.664	98.664	98.664
<b>PM<sub>10</sub></b>					
National total (row 141)	Annex I, 14/02/2024	243.577	179.911	182.509	184.558

## VII. Compliance with Emission Reduction Commitments (ERCs)

26. The national emission reduction commitments listed in Annex II of the NEC Directive 2016/2284 are applicable from 2020 to 2029. Therefore, the 2024 NECD inventory review included a compliance check of 2020, 2021 and 2022 air pollutant emission data against emission reduction commitments for 2020 to 2029 for the pollutants NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub> and PM<sub>2.5</sub>.

27. Table 6 provides an overview of Germany's compliance with the emission reduction commitments for the pollutants NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub> and PM<sub>2.5</sub> for emissions in 2020, 2021 and 2022. 2005 emissions reported in 2024 (E<sub>2005</sub>)<sup>11</sup> were used to perform the calculations underlying the compliance check. The % emission reduction commitment from the NEC Directive was applied to E<sub>2005</sub>, which gives the maximum allowed emission per year (MaxE<sub>p.a.</sub>) in the period 2020-2029. If the national total for compliance for a given year including technical corrections (accepted by Member State) and revised estimates (accepted by the TERT) (see also Table 5) is smaller than MaxE<sub>p.a.</sub>, compliance is considered achieved in that given year.

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<sup>11</sup> National total for compliance estimates including revised estimates accepted by the TERT, technical corrections accepted by Member State and, where applicable, inventory adjustment applications which the TERT recommended the EC to accept (see also Table 5) were used as E<sub>2005</sub>.

**Table 6: Overview of compliance with emission reduction commitments based on 2024 inventory submission<sup>12</sup>**

Pollutants	National total for compliance (kt) 2005	Emission reduction commitments 2020-2029 (%)	Maximum allowed emissions per year 2020-2029 (kt) <sup>a</sup>	National total for compliance (kt) 2020	National total for compliance (kt) 2021	National total for compliance (kt) 2022	Compliant in 2020 <sup>b</sup>	Compliant in 2021 <sup>b</sup>	Compliant in 2022 <sup>b</sup>
<b>NO<sub>x</sub></b>	1 478.365	-39%	901.803	872.454	859.491	840.861	-3%	-5%	-7%
<b>NMVOC</b>	1 167.043	-13%	1,015.327	725.706	751.868	747.417	-40%	-35%	-36%
<b>SO<sub>2</sub></b>	471.602	-21%	372.566	242.187	250.356	255.441	-54%	-49%	-46%
<b>NH<sub>3</sub></b>	626.705	-5%	595.369	541.603	525.482	512.222	-10%	-13%	-16%
<b>PM<sub>2.5</sub></b>	133.330	-26%	98.664	80.779	82.980	84.291	-22%	-19%	-17%

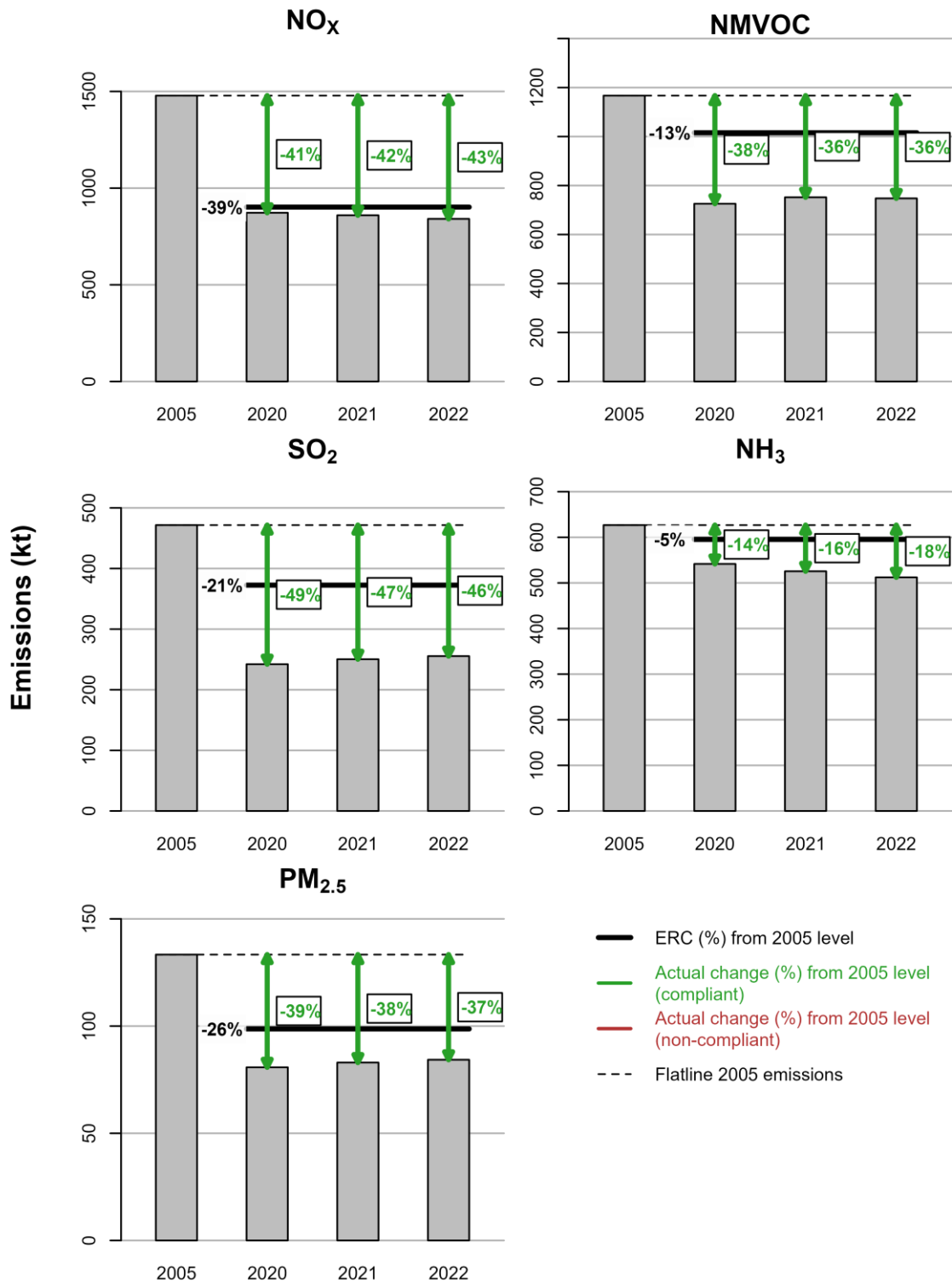
<sup>a</sup>  $\text{MaxE}_{p.a.} = E_{2005} - \% \text{ emission reduction commitments } 2020-2029 \times E_{2005}$

<sup>b</sup> Percentages express how much national totals for compliance need to be reduced by (in case of percentages >0) to meet emission reduction commitments (or, in case of percentages <0, how much national totals could increase by, while remaining compliant). Green cells indicate where compliance is achieved, and red cells indicate where compliance is not achieved.

<sup>12</sup> The tables presented in this report show numbers rounded to three decimal places for presentation purposes. However, for all calculations, all available decimal places were used. Therefore, calculations undertaken with the data with three decimal places shown in this table may lead to slightly different results than calculations undertaken with the precise data used for the assessment.

28. Germany is in compliance with its national emission reduction commitment for NO<sub>x</sub> in 2020, 2021 and 2022 (Figure 1).
29. Germany is in compliance with its national emission reduction commitment for NMVOC in 2020, 2021 and 2022 (Figure 1).
30. Germany is in compliance with its national emission reduction commitment for SO<sub>2</sub> in 2020, 2021 and 2022 (Figure 1).
31. Germany is in compliance with its national emission reduction commitment for NH<sub>3</sub> in 2020, 2021 and 2022 (Figure 1).
32. Germany is in compliance with its national emission reduction commitment for PM<sub>2.5</sub> in 2020, 2021 and 2022 (Figure 1).

Figure 1: Visual illustration of compliance with emission reduction commitments for NO<sub>x</sub>, NMVOC, SO<sub>2</sub>, NH<sub>3</sub> and PM<sub>2.5</sub><sup>13</sup>



<sup>13</sup> The compliance checks are based on absolute numbers using all decimal places provided by the Member State. Figure 1 serves only as visual illustration.

## VIII. Statement from Germany on the conclusions presented by the TERT

33. Germany agrees with the calculated estimates in Table 5.

## IX. TERT response to the statement from Germany

34. Germany did not raise any issues with the calculated estimates presented in Table 5 and therefore no response from the TERT is required.

## ANNEX I Technical corrections deemed necessary by the TERT and revised estimates provided by Germany

35. Germany did not have any technical corrections or revised estimates in the NECD inventory review 2024.

36. The TERT calculated technical corrections for cases:

- where it did not agree with the way in which a revised estimate or technical correction from the 2023 NECD inventory review was implemented and where no revised estimate was accepted by the TERT during the 2024 review;
- and where the suggested finding of the TERT would change the national total by more than 0.5% and where no revised estimate was accepted by the TERT during the review.

37. The methods for calculating the technical corrections are set up in the appendix to UNECE EB decision 2018/1 on technical revisions<sup>14</sup> and use the EMEP/EEA inventory guidebook as a reference for methods and emission factors.

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<sup>14</sup> ECE/EB.AIR/142/Add.1

## References and Supporting Documents

Annex I emission reporting template. Available at

<https://www.ceip.at/reporting-instructions>

ECE/EB.AIR/111/Add.1: Decision 2012/3: Adjustments under the Gothenburg Protocol to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them

[https://unece.org/DAM/env/documents/2013/air/ECE\\_EB.AIR\\_111\\_Add.1\\_ENG\\_DECISION\\_3.pdf](https://unece.org/DAM/env/documents/2013/air/ECE_EB.AIR_111_Add.1_ENG_DECISION_3.pdf)

ECE/EB.AIR/113/Add.1: Decision 2012/12: Guidance for adjustments under the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them

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ECE/EB.AIR/125: 2014 Reporting Guidelines for Estimating and Reporting Emission Data under CLRTAP  
[https://unece.org/fileadmin/DAM/env/documents/2013/air/eb/ece.eb.air.125\\_E\\_ODS.pdf](https://unece.org/fileadmin/DAM/env/documents/2013/air/eb/ece.eb.air.125_E_ODS.pdf)

ECE/EB.AIR/127/Add.1: Decision 2014/1: Improving the guidance for adjustments under the 1999 Protocol to Abate Acidification, Eutrophication and Ground-level Ozone to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them

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ECE/EB.AIR/142/Add.1: Decision 2018/1: Updated methods and procedures for the technical reviews of air pollutant emission inventories reported under the Convention

[https://www.ceip.at/fileadmin/inhalte/ceip/00\\_pdf\\_other/2019/decision\\_2018\\_1\\_advance\\_version\\_ece\\_eb.air\\_142\\_add.1.pdf](https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2019/decision_2018_1_advance_version_ece_eb.air_142_add.1.pdf)

EEA 2024. Air pollution in Europe: 2024 reporting status under the National Emission reduction Commitments Directive, Copenhagen.

<https://www.eea.europa.eu/publications/national-emission-reduction-commitments-directive-2024>

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<http://www.eea.europa.eu/publications/emep-eea-guidebook-2013>

EMEP/EEA: EMEP/EEA air pollutant emission inventory guidebook 2016, EEA Report No. 21/2016 European Environment Agency, Copenhagen. Available at:

<http://www.eea.europa.eu/publications/emep-eea-guidebook-2016>

EMEP/EEA: EMEP/EEA air pollutant emission inventory guidebook 2019, EEA Report No. 13/2019 European Environment Agency, Copenhagen. Available at:

<https://www.eea.europa.eu/publications/emep-eea-guidebook-2019>

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<https://www.eea.europa.eu/publications/emep-eea-guidebook-2023>

EU 2024. Dore C., Air Emission Inventory Review Guidelines 2024

<https://emrt-necd.eionet.europa.eu/eea-review-tool/4/1/>

NEC Directive 2016, Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC. [http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L\\_.2016.344.01.0001.01.ENG](http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.L_.2016.344.01.0001.01.ENG)

TFEIP (2022): “Inventory adjustments in the context of emission reduction commitments (ERC)” available at:

[https://www.ceip.at/fileadmin/inhalte/ceip/00\\_pdf\\_other/2022/technical\\_guidance\\_for\\_erc\\_adjustments\\_issue1.1.pdf](https://www.ceip.at/fileadmin/inhalte/ceip/00_pdf_other/2022/technical_guidance_for_erc_adjustments_issue1.1.pdf)