

# Final Review Report 2018

Second phase of review of national air  
pollution emission inventory data  
pursuant to the Directive on the Reduction of National  
Emissions of Certain Atmospheric Pollutants (Directive (EU)  
2016/2284 or 'NECD')

Germany

30 November 2018

Reference: 070203/2017/765105/SER/ENV.C.3

Umweltbundesamt GmbH  
Spittelauer Lände 5  
1090 Vienna  
Austria

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## Abbreviations

Adj	Adjustment
AD	Activity Data
EC	European Commission
EEA	European Environment Agency
EF	Emission Factor
EMEP	European Monitoring and Evaluation Programme
EMRT	Emission Review Tool
EU	European Union
GB	Guidebook
HMs	Heavy Metals
IE	Included Elsewhere
kt	Kilotonnes
LR	Lead Reviewer
MS	Member State
N	Nitrogen
NA	Not Applicable
NE	Not Estimated
NECD	National Emissions Ceilings Directive
NFR	Nomenclature for Reporting
NH <sub>3</sub>	Ammonia
NMVOC	Non-methane volatile organic compounds
NO	Not Occuring

NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Nitrogen oxides
PM <sub>2.5</sub>	Particulate matter equal to or less than 2.5 micrometres in diameter
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
VOC	Volatile organic compounds

## I. Introduction

1. The review of the air pollution emission data submitted by Member States (MS) under the European Union's National Emissions Ceilings Directive (Directive (EU) 2016/2284) is defined 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 second phase of the technical review of NECD inventories was undertaken in accordance with the EU Air emission inventory review guidelines under Service contract No. 070203/2017/765105/SER/ENV.C.3 (EU 2018).
3. The technical review assessed the implementation of all recommendations, potential technical corrections and revised estimates from the NECD Review 2017. The Review Reports from the year 2017<sup>1</sup> were the base for this assessment. In addition an in-depth review of the national emission inventories of the POPs and heavy metals was initiated and in accordance with the requirements of the NECD (Article 5(8)), all new adjustment applications submitted in 2018 were reviewed in-depth and all adjustment applications submitted in 2018, that were already submitted, reviewed and accepted in 2017 were reviewed with a focus on reviewing the consistency in the reporting of these adjustment applications: For the review of the adjustment applications the Technical Guidance for Parties Making Adjustment Applications and for the Expert Review of Adjustment Applications (ECE/EB.AIR/130)<sup>2</sup> was used.

## II. Objectives of the review

4. The general objective of the second phase of the technical review of Member States' NECD inventories as reported in February 2018 (and updated before 15 March 2018) was an improvement of transparency, consistency, comparability, completeness and accuracy of submitted data and as such will contribute to establishing accurate, reliable and verified emission inventories for all Member States.
5. The specific objectives of the second phase of the technical review of Member States' NECD inventories were:

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<sup>1</sup> Available at <http://ec.europa.eu/environment/air/reduction/implementation.htm>

<sup>2</sup> [http://www.ceip.at/fileadmin/inhalte/emep/Adjustments/ECE\\_EB\\_AIR\\_130\\_AV\\_for\\_the\\_web.pdf](http://www.ceip.at/fileadmin/inhalte/emep/Adjustments/ECE_EB_AIR_130_AV_for_the_web.pdf)

- a. a detailed review to verify that Member States have effectively integrated the revised estimates, technical corrections and other relevant recommendations from the 2017 in-depth EU review in their national emission inventories
  - i. a full in-depth review of national emission inventories, including the calculation of technical corrections, for Greece and Finland as these Member States were not reviewed in-depth in 2017 due to the lack of reporting of the necessary quantitative and qualitative data in 2017
  - ii. the adjustment applications submitted in 2018, that were already submitted, reviewed and accepted in 2017 under the new NECD (and/or previously under CLRTAP), with a focus on reviewing the consistency in the reporting of these adjustment applications;
- b. initiation of an in-depth review of the national emission inventories of the POPs and heavy metals for which the new NECD sets out mandatory reporting (see table A of Annex I of Directive (EU) 2016/2284), i.e. polycyclic aromatic hydrocarbons (PAHs), dioxins/furans, polychlorinated biphenyls (PCBs), hexachlorobenzene (HCB), cadmium (Cd), mercury (Hg) and lead (Pb);
- c. an expert review of
  - i. new adjustment applications submitted in 2018, not submitted and reviewed yet in 2017 under the new NECD, including the review of the supporting documentation as requested in part 4 of Annex IV of the new NECD and an assessment of whether the adjustment application is consistent with the circumstances described therein
  - ii. the adjustment applications submitted in 2018, that were already submitted, reviewed and accepted in 2017 under the new NECD (and/or previously under CLRTAP), with a focus on reviewing the consistency in the reporting of these adjustment applications;
6. The review also sought to harmonise approaches used in monitoring inventories reported under the NECD with reviews undertaken by other organisations that have similar interests such as the reviews under the LRTAP Convention and the EU Greenhouse Gas Monitoring Mechanism (MMR)/United Nations Framework Convention on Climate Change (UNFCCC).

### III. Review approach, team and scope

7. For the **Follow-up to the 2017** in-depth EU review the TERT performed a consistent and detailed review to verify that all Member States have effectively integrated the revised estimates, technical corrections and other relevant recommendations from the 2017 in-depth EU review in their national emission inventories of SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>2.5</sub>, NMVOC and NH<sub>3</sub>.

For Greece and Finland that were not reviewed in-depth in 2017 due to the lack of reporting of the necessary quantitative and qualitative data in 2017, an in-depth review of their national emission inventories of SO<sub>2</sub>, NO<sub>x</sub>, PM<sub>2.5</sub>, NMVOC and NH<sub>3</sub> was performed in accordance with the requirements in the guidelines and guidance that were prepared for the 2017 in-depth EU review.

8. For the **first phase of the in-depth review of national emission inventories of POPs and heavy metals** the TERT focused on the completeness and consistency in the emission reporting of PAHs, dioxins/furans, PCBs, HCB, Cd, Hg and Pb with special emphasis on the review of identified key categories.

9. The results of this first phase of the in-depth review were general and sector specific recommendations for quick and obvious improvements of Member States' POPs and heavy metals inventories and did not include proposals for technical corrections or revised estimates. Focus was on the years 1990 (most common reference year used for compliance with basic reduction obligations under the POPs and heavy metals protocols), on 2005 and 2016. However, the consistency of time series data was also checked for all reported years.
10. **Review of adjustment applications:** New adjustment applications submitted in 2018 were reviewed in depth. Adjustment applications submitted in 2018, that were already submitted, reviewed and accepted in 2017 under the new NECD (and/or previously under CLRTAP) were reviewed with a focus on consistency in the reporting of these adjustment. The review of adjustment applications followed the Review Guidance. The review was performed by relevant sector experts reviewing particular sectors and coordinated by the adjustment lead reviewer.
  11. The review was split in two phases:
    - a) **Initial checks** were carried out (by the project team) under service contract No. 70203/2017/765105/SER/ENV.C.3 and by the EU inventory team (ETC/ACM). Significant findings from the initial checks that were relevant for the second phase of the technical review and that were not resolved within the initial check phase were followed up by the TERT in the comprehensive desk and centralised review.
    - b) **A Desk Review and Centralised Review** was performed by the TERT under service contract No 70203/2017/765105/SER/ENV.C.3 of the Directorate General Environment of the European Commission. The TERT consisted of the following experts:
      - *Lead Reviewers:* Justin Goodwin, Kevin Hausmann, Ole-Kenneth Nielsen and Kristina Saarinen
      - Energy: Rianne Drøge, Stephan Poupa, Glen Thistlethwaite and Katrina Young
      - Transport: Jean Marc André, Giorgos Melios, Tim Murrells and Giannis Papadimitriou
      - IPPU: Coralie Jeannot, Jeroen Kuenen, Ardi Link and Iis Moorkens
      - Agriculture: Michael Anderl, Bernard Hyde, Mette Mikkelsen and Beatriz Sánchez
      - Waste: Céline Gueguen and Garnt Jans Venhuis.
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    - Agriculture: Michael Anderl, Bernard Hyde, Mette Mikkelsen and Beatriz Sánchez
    - Waste: Céline Gueguen and Garnt Jans Venhuis.
12. The Desk Review and Centralised Review were coordinated by the project team (Sabine Schindlbacher, Katarina Mareckova, Chris Dore and Emma Salisbury).
13. The EEA Review Secretariat consisting of Federico Antognazza and Anke Lükewille supported the second phase of the technical review of Member States' NECD inventories.
14. The review was performed on the basis of NECD emission data officially reported by Member States by 15 February 2018 and the Informative Inventory Reports (IIRs) reported by 15 March 2018 under the revised NEC Directive. Resubmissions and other additional information provided by Member States during the review were taken into account until 03 May 2018.
15. To avoid any potential conflicts of interest, the lead reviewers and sector review experts did not review emission inventories of Member States where these individuals have themselves contributed to the compilation of that inventory, or presently are or have been any 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 take part in the review of that inventory.

16. All review experts signed confidentiality agreements in which they agreed to keep information received by Member States confidential.

**Table 1.: Scope of the comprehensive technical review NECD 2018 (under (EU) 2016/2284<sup>3</sup>)**

Element	Scope	Further information
Member States	EU geographical coverage of the MS	This Directive shall apply to emissions of the pollutants referred to in Annex I from all sources occurring in the territory of the MS, their exclusive economic zones and pollution control zones. This Directive does not cover emissions in the Canary Islands, the French overseas departments, Madeira, and the Azores.
Years	<p><b>Issues raised in 2017 review:</b> 2005, 2010, 2015, 2016</p> <p><b>HMs and POPs:</b> 1990, 2005, 2016</p> <p><b>Issues raised in 2017 review:</b> NO<sub>x</sub>, NMVOC, SO<sub>x</sub>, NH<sub>3</sub>, PM<sub>2.5</sub></p> <p><b>Review of POPs and Heavy Metals:</b> PAHs, dioxins/furans, PCBs, HCB, Cd,Hg and Pb</p>	<p>In addition, time series consistency was reviewed across the whole time series.</p>
Pollutants		According to NECD Article 1(1)
Categories	All NFR categories, including selected memo items	<p>All NFR categories as listed in Annex 1 of reporting guidelines including the following memo items:</p> <ul style="list-style-type: none"> <li>1A3ai(i) International aviation cruise (civil)</li> <li>1A3aii(ii) Domestic aviation cruise (civil)</li> <li>1A3di(i) International maritime navigation</li> <li>1A3 Transport (fuel used) – where a MS uses fuel used for compliance purposes.</li> </ul>
National totals	National total and National total for compliance	Rows 141 and 144 in Annex I to reporting Guidelines

<sup>3</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



#### IV. Findings and Conclusions from the Technical Expert Review Team (TERT) for the follow-up to the 2017 in-depth EU review

17. The TERT assessed the implementation of all recommendations, technical corrections and revised estimates from the NECD Review 2017. This assessment was based on the inventory data submitted under the NECD in 2018 by Germany pursuant to (Directive (EU) 2016/2284) and the Germany Review Report from the year 2017.
18. Germany did not provide any resubmission.
19. Table 2 summarises the conclusions of the TERT as to whether the recommendations and revised estimates from the NECD Review 2017 were implemented.
  - a. Recommendations: The TERT noted that Germany has implemented some of the recommendations following the 2017 NECD review. The TERT recommends that Germany implements all remaining recommendations by the next submission and flags that this is the second year in which these recommendations have been made.
  - b. Revised estimates: Germany implemented all of the revised estimates from the NECD Review 2017.
20. The TERT noted that all of the recommendations related to the use of the 2013 EMEP/EEA Guidebook were implemented.
21. The TERT considers that it received responses from that were sufficient to undertake the follow-up to the 2017 in-depth EU review.

**Table 2: Recommendations from the NECD Review 2017, considering revised estimates (RE), technical corrections (TC) and their status of implementation in the inventory submission 2018**

Review year of initial recommendation	Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation made in previous review report	RE or TC in 2017	Assessment of Implementation	RE or TC in 2018	Tier 1 KC <sup>4</sup>	GB 2016 Issue <sup>5</sup>
2017	DE-1A1-2018-0001	No	1A1 Energy Production, NH <sub>3</sub> , 2005-2015	The TERT noted that in the NFR tables there are NH <sub>3</sub> emissions estimated for most of stationary combustion (1A1 Energy Production) activities. However, there is a lack of transparency regarding which EF are used to estimate NH <sub>3</sub> emissions in the IIR. In response to a question raised during the review, Germany provided NH <sub>3</sub> EF for all stationary combustion sectors and all fuels. Germany also explained that for some NH <sub>3</sub> EF, the source may be outdated and not well documented. The TERT acknowledged the explanation provided by Germany. The TERT noted that this issue does not relate to the threshold of significance for a technical correction. The TERT recommends that Germany presents its NH <sub>3</sub> EF for stationary combustion in the next submission of its IIR and includes justifications for the values compared to 2016 EMEP/EEA Guidebook values.	No	For category 1A1, 1A2, 1A4, pollutant NH <sub>3</sub> , all years, the TERT noted that there is a lack of transparency regarding the emission factors and a potential underestimate of emissions due to emission factors significantly lower than the 2016 EMEP/EEA Guidebook. In response to a question raised during the review, Germany explained the development of the country specific emission factor and justification of the values over the defaults. The TERT recommends that Germany includes a summary of the explanatory information provided of the emission factor in their 2019 submission, even if the emission factor itself is not included.	No	No	No
2017	DE-1A1a-2018-0001	No	1A1a Public Electricity and Heat Production, SO <sub>2</sub> , NO <sub>x</sub> , NH <sub>3</sub> , NMVOC, PM <sub>2.5</sub> , 2003-2015	In the IIR, chapter '1A1a Public Electricity and Heat Production, the TERT noted that the graph on AD for waste and biomass, years 2003 to 2011 seems over-estimated compared to the trends 1990-2002 and 2012-2015. In response to a question raised during the review, Germany explained that there is a planned revision of activity data for biogas.	No	For category 1A1a and pollutants SO <sub>x</sub> , NO <sub>x</sub> , PM <sub>2.5</sub> , years 2005 and 2010, the TERT noted that there was a potential over-estimation of emissions, in relation to DE-1A1a-2017-0003 from the 2017 NECD Review, due to a revision of biogas data. In response to a question	No	No	No

<sup>4</sup> Tier 1 used for a key category

<sup>5</sup> Issue related to use of GB prior to the 2016 version

Review year of initial recommendation	Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation made in previous review report	RE or TC in 2017	Assessment of Implementation	RE or TC in 2018	Tier 1 KC <sup>4</sup>	GB 2016 Issue <sup>5</sup>
				Germany also provided some preliminary revised estimates based on discussions with the working group on renewable energy statistics (new consumptions and new SO <sub>2</sub> /NO <sub>x</sub> EFs for period 2003-2011) for years 2005 and 2010 for pollutants SO <sub>2</sub> /NO <sub>x</sub> /PM <sub>2.5</sub> . The TERT agreed with the general approach and assumptions for this preliminary revised estimate provided by Germany (except that Germany provided emissions calculated in kt but they are actually tonnes). The TERT noted that this preliminary revised estimate is below the threshold of significance for technical correction for all mentioned pollutants. The TERT recommends that Germany includes the revised estimate in its next submission.		raised during the review, Germany explained that a project is ongoing, and expect to be able to implement the updates in the 2020 submission. The TERT notes that the potential over-estimation is below the threshold of significance for a technical correction. The TERT recommends that Germany update the emissions based on the revised biogas data from the working group on renewable energy statistics for the 2020 submission, transparently documenting the changes, or else provide an update on the revision and when implementation is planned.			
2017	DE-1A1b-2018-0001	Yes	1A1b Petroleum Refining, SO <sub>2</sub> , NO <sub>x</sub> , NH <sub>3</sub> , NMVOC, PM <sub>2.5</sub> , 2005-2015	For category 1A1b Petroleum Refining, all pollutants, the TERT noted that the IIR is not fully transparent (chapter '1A1b Petroleum Refining', paragraph on emission factors). The IIR states that EF used come from a research project which is described in chapter 1A1a. The table in chapter 1A1a is titled 'IEF for Public Electricity and Heat Production' and is probably not applicable to NFR 1A1b. Moreover, fuels consumed in refineries are specific and no EF for refinery gas are presented. Recommendation 55 of the in-depth CLRTAP review in 2014 has already highlighted this lack of transparency. In response to a question raised during the review, Germany provided its country specific EF used in sector 1A1b for SO <sub>2</sub> , NO <sub>x</sub> ,	No	The TERT reiterates recommendation DE-1A1b-2017-0001 from the 2017 NECD Review that Germany includes the country specific EF for combustion in refineries in the relating chapter of its IIR to improve transparency. In response to a question raised during the review, Germany explained that a project reviewing the refinery emission factors is ongoing, but that it is not clear when the revisions will be implemented in the inventory, and that the currently-used emission factors were not added to the IIR due to resource constraints. The TERT also recommends that Germany	No	No	No

Review year of initial recommendation	Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation made in previous review report	RE or TC in 2017	Assessment of Implementation	RE or TC in 2018	Tier 1 KC <sup>4</sup>	GB 2016 Issue <sup>5</sup>
				NM VOC and PM <sub>2.5</sub> . The TERT notes that this issue does not relate to an over or under-estimate and recommends that Germany includes the country specific EF for combustion in refineries in the relating chapter of its IIR to improve transparency.		includes an update on the emission factor project in the next submission and implement them when available.			
2017	DE-2B3-2018-0001	No	2B3 Adipic Acid Production, NO <sub>x</sub> , 1990-2015	For category 2B3 Adipic Acid Production for 1990 - 2015, in response to a question raised during the review Germany provided justification that NO <sub>x</sub> and CO emissions from this source are below the threshold of significance. The TERT agrees that emissions are indeed expected to be below the threshold of significance. Since a method is available in the 2016 EMEP/EEA Guidebook for estimating NO <sub>x</sub> and CO emissions from adipic acid production, the TERT recommends that Germany includes these emissions in the next submission preferably using a country specific method to account for the specific technologies and abatement equipment applied.	No	The TERT reiterates recommendation DE-2B3-2017-0001 from the 2017 NECD Review that Germany includes NO <sub>x</sub> emissions from 2.B.3 Adipic acid production emissions in the next submission, preferably by using a country specific method to account for the specific technologies and abatement equipment applied. During the 2018 NECD Review, Germany confirmed that the recommendation would be addressed for the 2019 submission.	No	No	No
2017	DE-2B6-2018-0001	No	2B6 Titanium Dioxide Production, NO <sub>x</sub> , 1990-2015	For category 2B6 Titanium Dioxide Production for 1990 - 2015, in response to a question raised during the review Germany provided justification that greenhouse gas and air pollutant emissions from this source are below the threshold of significance. The TERT agrees that emissions are indeed below the threshold of significance. Since a method is available in the 2016 EMEP/EEA Guidebook for estimating NO <sub>x</sub> , CO and TSP emissions from titanium dioxide production, the	No	The TERT reiterates recommendation DE-2B6-2017-0001 from the 2017 NECD Review. The TERT recommends that Germany includes the emissions in the next submission. During the 2018 NECD Review, Germany confirmed that its expects to be able to address the recommendation in its next submission.	No	No	No

Review year of initial recommendation	Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation made in previous review report	RE or TC in 2017	Assessment of Implementation	RE or TC in 2018	Tier 1 KC <sup>4</sup>	GB 2016 Issue <sup>5</sup>
				TERT recommends that Germany includes these emissions in the next submission.					
2017	DE-2C3-2018-0002	No	2C3 Aluminium Production, NO <sub>x</sub> , 1990-2015	For NO <sub>x</sub> emissions from category 2C3 Aluminium Production for years 1990-2015, in response to a question raised during the review Germany indicated that it did not include NO <sub>x</sub> emissions because they believe the default 2016 EMEP/EEA Guidebook emission factor to be over-estimated. The TERT noted that the issue is below the threshold of significance for a technical correction, as initial calculations done by the TERT show that NO <sub>x</sub> emissions from primary aluminium production will not exceed 0.1 % of national total emissions. The TERT recommends that Germany includes NO <sub>x</sub> from aluminium production in the next submission to improve completeness and comparability. If country specific data cannot be estimated, then 2016 EMEP/EEA Guidebook emission factors should be used.	No	The TERT has noted that the estimation of NO <sub>x</sub> emissions for category 2C3 Aluminium Production (following recommendation DE-2C3-2017-0001) is not included in the 2018 submission and that in the 2018 IIR no reference to planned improvement for the inventory submission in 2019 is made. In response to questions during the review Germany indicated that it was inappropriate to use default factors for estimating emissions but that it would try to get information to report in the submission 2019 realistic emissions of NO <sub>x</sub> related to primary aluminium production or use the 2016 EMEP/EEA Guidebook emission factor. The TERT notes that, due to the abatement applied in Germany, any emissions will be below the threshold of significance and recommends that Germany make estimates for its next submission to provide transparent documentation in its IIR. Where notation keys are used, the TERT recommends that Germany provides transparency justification in its IIR.	No	No	No

Review year of initial recommendation	Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation made in previous review report	RE or TC in 2017	Assessment of Implementation	RE or TC in 2018	Tier 1 KC <sup>4</sup>	GB 2016 Issue <sup>5</sup>
2017	DE-2D3d-2018-0001	Yes	2D3d Coating Applications, NMVOC, 1994.00	For category 2D3d Coating Applications, NMVOC, 1994 the TERT notes a significant dip in the time series in 1994 that may relate to an under-estimate in emissions. This under-estimate may be above the threshold of significance. In response to a question raised during the review, the Germany explained that "the difference between 1993 and 1994 has to be mainly linked to the enhancement of the emission calculation method as from 1996. Since then national production and foreign trade statistics has been used for the calculation of product and solvent consumption instead of expert judgements. However, a recalculation could only be done backwards to the year 1994 due to the unavailability of production and foreign trade statistics before (German reunification)". The TERT recommends that this explanation is included in the next submission.	No	For NMVOC emissions from 2D3d Coating Applications for 1994 the TERT notes that recommendation (DE-2D3d-2017-0001) is not yet implemented. The TERT notes that Germany explains in its IIR (Chapter 8.2 - Improvements) that the explanation on recalculation to 1994 will be included in the next submission. In response to questions during the review Germany indicated that there was no progress with recalculations. The TERT notes that any revision would be below the threshold of significance and recommends that Germany make efforts to update the estimates and provides information on progress in its next submission.	No	No	No
2017	DE-5A-2018-0001	No	5A Biological Treatment of Waste - Solid Waste Disposal on Land, NMVOC, PM <sub>2.5</sub> , 2005;2010;2015	For NMVOC and PM <sub>2.5</sub> emissions from 5A Biological Treatment of Waste - Solid Waste Disposal on Land for the full time series, the TERT noted that emissions are not reported although default EF are provided in the 2016 EMEP/EEA Guidebook. In response to a question raised during the review, Germany provided a draft estimate to demonstrate that the impact is below the threshold of significance of technical correction for NMVOC. The TERT agreed that NMVOC emissions are expected to be below the threshold of significance. The TERT also expects PM <sub>2.5</sub> emissions	No	The 2017 review report recommended that Germany include an estimation of emissions for NMVOC and PM <sub>2.5</sub> emissions from 5A for the full time series in its next submission (recommendation DE-5A-2017-0001). The TERT noted that, in the 2018 submission, emissions are not reported although default EF are provided in the 2016 EMEP/EEA. In 2017 Germany provided sufficient evidence to show that NMVOC and PM <sub>2.5</sub> are below the	No	No	No

Review year of initial recommendation	Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation made in previous review report	RE or TC in 2017	Assessment of Implementation	RE or TC in 2018	Tier 1 KC <sup>4</sup>	GB 2016 Issue <sup>5</sup>
				to be below the threshold. The TERT recommends that Germany include NMVOC and PM <sub>2.5</sub> emissions from 5A in its next submission. In addition, the TERT recognise that the 2013 EMEP/EEA Guidebook reference "US Environmental Protection Agency (US EPA) may not be presented in a clear way. However, Germany did undertake calculations that agree with reference material indicating that CH <sub>4</sub> is a maximum of 30 to 40% of landfill gas (the rest mainly composed of CO <sub>2</sub> and other gases, including NMVOC) and that he CH <sub>4</sub> corresponds to 98.7 % of VOC. The calculations made by Germany demonstrate that NMVOC emissions are below the threshold of significance.		threshold of significance. In response to a question, Germany indicated that NMVOC and PM <sub>2.5</sub> will be added during the following submissions. The TERT recommends that Germany include these emissions its next submission.			
2017	DE-5D-2018-0001	No	5D Wastewater Handling, NMVOC, 2005;2010;2015	For 5D Wastewater Handling, NMVOC 2005;2010;2015, in response to a question raised during the review Germany indicated that there is an under-estimate that is far below the threshold of significance for a technical correction. Germany also indicated that it already planned to develop and implement a country specific methodology. The TERT recommends that Germany includes the estimation of NMVOC emissions from wastewater treatment plant in its next submission.	No	The TERT noted that, as asked in the 2017 NECD review report, Germany has included NMVOC emissions from 5D in its 2018 submission. In response to a question raised during the review, Germany confirmed that AD does include wastewater treated in septic tanks. The AD expected in the 2016 EMEP/EEA Guidebook is the "amount of wastewater handled in all wastewater treatment plants in the country" and, therefore, no NMVOC emissions has to be estimated from volumes of wastewater treated with not-centralised systems (such as septic tanks). The TERT noted that the issue is far below the	No	No	No

Review year of initial recommendation	Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation made in previous review report	RE or TC in 2017	Assessment of Implementation	RE or TC in 2018	Tier 1 KC <sup>4</sup>	GB 2016 Issue <sup>5</sup>
						threshold of significance for a technical correction but recommends that Germany estimate NMVOC emissions from volumes of wastewater handled in centralised treatment plants.			



## V. Findings and Conclusions from the Technical Expert Review Team (TERT) for the first phase of the in-depth review of national emission inventories of POPs and heavy metals

22. The TERT checked the national inventory data submitted under NECD submitted in 2018 by Germany pursuant to (Directive (EU) 2016/2284).
23. Germany did not provide any resubmission.
24. The TERT carried out checks to verify the transparency, accuracy, consistency, comparability and completeness of the HMs and POPs inventory. The focus was on the years 1990, 2005, and 2016.
25. The TERT considers that it received responses from Germany that were sufficient to undertake the first phase of the in-depth review of national emission inventories of POPs and heavy metals appropriately.
26. Transparency and Consistency: The TERT found the submitted inventory to be sufficiently detailed and documented. Germany provided some additional explanatory information on request.
27. Completeness: The TERT identified several cases where no emission estimate was provided though methods are provided in the 2016 EMEP/EEA Guidebook.
28. The TERT noted that Tier 2 methods are in general used for key categories. Instances where a Tier 1 method was used for a key category are flagged in Table 3.
29. Notation keys: The TERT noted that for the reporting of HMs and POPs the use of the notation keys is not always consistent with the Reporting Guidelines. These inconsistencies are elaborated in the table below.
30. The TERT noted that the submitted HMs and POPs inventory is compiled in line with the 2016 EMEP/EEA Guidebook and Directive (EU) 2016/2284.
31. The TERT noted that for HMs and POPs reported national total for compliance (row 144) does not differ from national total (row 141) and is reported in line with NEC Directive.
32. The TERT noted that Germany reported transport emissions based on fuel sold and has not additionally reported transport emission based on fuel used. This is in line with the reporting guidelines. The reporting of emissions based on fuel sold is mandatory.
33. The TERT identified **recommendations in order to improve the national HMs and POPs** inventory data of Germany (see Table 3).

**Table 3: Recommendations from the NECD Review 2018 concerning the first phase of the in-depth review of national emission inventories of POPs and heavy metals<sup>6</sup>**

Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation	Tier 1 used for a key category	Issue related to use of GB prior to the 2016 version
DE-2D3g-2018-0001	Yes	2D3g Chemical Products, PAHs, 1990, 2005, 2016	The TERT notes that Germany reported “NA” for PAHs, for 2D3g Chemical products, for 1990, 2005, 2016. The TERT also notes that there exists a Tier 2 method and EF in the GB2016 (Tables 3-9 and 3-10 of 2.d.3.g Chemical products), for the PAH Benzo(a)pyrene. At the moment, the EF given in this table is wrong, but it will be replaced with a correct EF in the GB 2019. The TERT recommends Germany to collect AD for this emission source and to calculate PAHs emissions and to document the methodology as soon as the corrected EF becomes available.	No	No
DE-1A3bi-2018-0002	No	1A3bi Road Transport: Passenger Cars, SO <sub>2</sub> , NO <sub>x</sub> , NH <sub>3</sub> , NMVOC, PM <sub>2.5</sub> , PAHs, PCBs, HCB, Cd, Hg, Pb, PCDD/F, 1990-2015	For 1A3bi Road Transport: Passenger Cars / liquid fuels, the TERT noted that for all years 1990-2016 that incorrect notation keys are used for activity data in the NFR tables. A notation key ‘NA’ is used which is not appropriate for the activity data associated with this sector fuel type. The TERT notes that correct values have been provided for other fuels and other 1A3b categories and activity data for 1A3bi Road Transport: Passenger Cars are also provided in the IIR. In response to a question raised during the review, Germany acknowledged a reporting mistake and explained that numbers will be provided in the next 2019 submission. The TERT notes that this issue does not relate to an over or under-estimate and recommends that activity data for 1A3bi liquid fuels are provided in the NFR tables.	No	No
DE-1A3bv-2018-0001	No	1A3bv Road Transport: Gasoline Evaporation, PCBs, HCB, 1990-2015	For 1A3bv Road Transport: Gasoline Evaporation / liquid fuels, the TERT noted the incorrect use of notation keys for HCB and PCB emissions. ‘NE’ is used when the TERT considers that ‘NA’ would be more appropriate. In response to a question raised during the review, Germany agreed that notation key ‘NE’ will be replaced by ‘NA’. The TERT notes that this issue does not relate to an over or under-estimate and recommends that the notation key is changed for HCB and PCB emissions in the next submission.	No	No

<sup>6</sup> The recommendations in this table are a result of the review of the POPs and HMs inventories. The TERT have, in some instances, highlighted where these recommendations may also affect other pollutants.

Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation	Tier 1 used for a key category	Issue related to use of GB prior to the 2016 version
DE-1A4cii-2018-0001	No	1A4cii Agriculture/ Forestry/ Fishing: Off-road vehicles and Other Machinery, Cd, 2005-2015	For 1A4cii Agriculture/ Forestry/ Fishing: Off-road vehicles and Other Machinery Cd emissions the TERT noted an erratic trend in IEF since 2007. In response to a question raised during the review, Germany explained that this is strongly influenced by the trend in gasoline consumption for which the EF are higher than for diesel consumption, but it was also aware of an issue in the primary activity data for gasoline consumption as provided in the National Energy Balance, showing a remarkable decrease in 2012 and an increase in 2015. Germany is checking this most likely faulty trend in gasoline consumption for 1A4cii with the NEB provider and expects corrected activity data and emissions to be provided in the next annual submission. The TERT notes that this issue does not relate to an over or under-estimate and recommends that this issue on the trend in primary activity data for gasoline consumption by 1A4cii is resolved with the national energy statistics for correcting in the next submission. The TERT also notes that whilst the activity data provided for liquid fuels and biomass provided in the NFR tables are consistent with the figures shown in the wiki IIR for 1A4cii as a whole, the NFR figures for liquid fuels are not consistent with the sum of the liquid fuels data shown in the individual tables for agricultural machinery and forestry machinery separately. The same is the case in the figures for biomass (sum of figures in tables for agriculture plus forestry not being the same as figures shown in table for agriculture & forestry combined). The TERT recommends that this minor inconsistency in the IIR tables is resolved for the next submission.	No	No
DE-1A4ciii-2018-0001	No	1A4ciii Agriculture/ Forestry/ Fishing: National Fishing, SO <sub>2</sub> , NO <sub>x</sub> , NH <sub>3</sub> , NMVOC, PM <sub>2.5</sub> , PAHs, PCBs, Cd, Hg, Pb, PCDD/F, 2016	For 1A4ciii Agriculture/ Forestry/ Fishing: National Fishing, the TERT noted a large increase in AD from 2015 to 2016 when in all previous years the activities had shown a steady slow downward trend. This observation was noted in the German IIR, and in response to a question raised during the review, Germany stated that the fuel consumption in national maritime fishery has been estimated based mainly on AIS and fleet data within the BSH model maintained at the Federal Maritime and Hydrographic Agency (Bundesamt für Seeschifffahrt und Hydrographie), but the large increase cannot be explained. Germany stated that this will be looked at in advance of the next submission. The TERT notes that this issue does not relate to an over or under-estimate and recommends that this unexpected trend in AD between 2015 and 2016 is investigated for the next submission.	No	No

Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation	Tier 1 used for a key category	Issue related to use of GB prior to the 2016 version
DE-1B2aiv-2018-0001	No	1B2aiv Fugitive Emissions Oil: Refining / Storage, Cd, Hg, PCDD/F, 1990, 2005, 2016	For category 1B2aiv Fugitive Emissions Oil: Refining / Storage and pollutants Hg, Cd, PCDD/F the TERT noted that there was a potential under-estimate of emissions as these were reported as 'NA'. In response to a question raised during the review, Germany explained that these emissions are included in 1A1b to avoid double counting. The TERT recommends that Germany update the notation key to 'IE' and transparently document the allocation of emissions in the 2019 submission.	No	No
DE-2C1-2018-0001	No	2C1 Iron and Steel Production, HCB, 1990, 2005, 2016	The TERT notes for 2C1 Iron and Steel Production, for HCB, for 1990, 2005 and 2016 that there may be an under-estimate of emissions since the notation key 'NA' is reported while there is an activity occurring and a method and EF exist in the 2016 EMEP/EEA Guidebook. In response to a question raised during the review Germany explained that the EF in the 2016 EMEP/EEA Guidebook was not appropriate and that no other measurement data were available. Germany indicated that it will consider measurements-based estimates but that these can be expected no earlier than for the submission in 2020. For the next submission, Germany will consider changing the notation key from 'NA' to 'NE'. The TERT recommends that Germany update its notation key and considers the development of measurement-based estimates for future submissions.	No	No
DE-2C3-2018-0001	No	2C3 Aluminium Production, HCB, 1990, 2005, 2016	The TERT notes for 2C3 Aluminium Production, for HCB, for 1990, 2005 and 2016 that there may be an under-estimate of emissions since the notation key 'NE' is reported while there is an activity occurring and a method and EF exist in the 2016 EMEP/EEA Guidebook. In response to a question raised during the review Germany explained that the 2016 EMEP/EEA Guidebook provides an emission factor for HCB for secondary aluminium production (Tables 3-4 in the 2C3 Aluminium Production 2016 Chapter) of 5 g HCB/ tonne Aluminium produced and that this value from 1992 is due to the use of hexachloroethane for degassing purposes in refining operations at that time, resulting in hexachlorobenzene emissions (see 2006 EMEP/EEA Guidebook, file B3310vs2.2.pdf page 8) and that since the use of hexachloroethane is prohibited by law in Germany since 2002 (see also VDI 2086-2, TA Luft) there is no valid source for HCB emission from 2002 on. Germany also explained that on national emissions of HCB in secondary aluminium production for the period 1990-2001 no data are available for 2 reasons:	No	No

Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation	Tier 1 used for a key category	Issue related to use of GB prior to the 2016 version
			Firstly, there is no emission limit value for HCB according, and hence emissions of HCB usually are not monitored. And secondly, HCB emissions are difficult to monitor because HCB is more volatile than dioxins or PCBs and therefore HCB monitoring would require application of particular sampling and measuring methods. Secondly, to overcome this data gap they will try to get information to report in the submission 2019 realistic emissions of HCB related to secondary aluminium production otherwise they will use the 2016 EMEP/EEA Guidebook emission factor. The TERT recommends Germany to continue to explore approaches to estimating emissions and to include transparent information on the justification for its estimates and notation keys in its IIR.		
DE-2D3a-2018-0001	No	2D3a Domestic Solvent Use Including Fungicides, Hg, 1990, 2005, 2016	Following a question during the review, Germany provided an explanation of its rationale for not estimating emissions in category 2D3a. Germany indicated it will consider changing the notation key from 'NA' to 'NE'. Germany also highlighted that fluorescent tubes can still contain mercury and could therefore lead to mercury emissions. They noted that a project is planned for the next year for data acquisition of actual fluorescent tubes quantities and that they will try to use that data to estimate mercury emissions and implement the results in the submission 2020. The TERT recommends that Germany provides this clarification in its IIR and works towards estimating any relevant emissions for its 2020 submission.	No	No
DE-5-2018-0001	No	5C1bv Cremation, Hg, 1990, 2005, 2016	For 5C1bv Cremation, the TERT noted that the Hg EF is 100 times smaller than the default value proposed in the 2016 EMEP/EEA Guidebook and the Cd and Pb EF are 1000 times smaller than the default values proposed in the 2016 EMEP/EEA Guidebook. In response to a question raised during the review, Germany explained that the EF for Pb and Cd are based on national (UBA) expert judgement and that the Hg EF was calculated on the basis of the German report on "OSPAR Recommendation 2003/4 on controlling the dispersal of mercury from crematoria". No information concerning Heavy Metals is provided in the IIR. The reference of the Hg EF is much more detailed in the OSPAR 2006 report than in the IIR. Moreover, Germany indicated that the current analysis of measured data would decrease the Country Specific EF further. The TERT acknowledges that the EF could be lower than the default values proposed in the 2016 EMEP/EEA Guidebook because of abatement technologies. However, as cremation may be a key category for Hg in some EU countries, the TERT recommends that Germany provides in the	Yes	No

Observation	Key Category	NFR, Pollutant(s), Year(s)	Recommendation	Tier 1 used for a key category	Issue related to use of GB prior to the 2016 version
			IIR more transparent references and further justification on the discrepancy between country-specific and default EMEP/EEA values, especially concerning Hg EF.		

## VI. Cross cutting recommendations on HMs and POPs

34. The TERT identified the following cross-cutting issues for improvement in the inventory and recommends that Germany:
- Completes its emission inventory by estimating currently missing emissions;
  - Uses the notation key 'NE' where emissions are expected to occur but are not estimated and corrects the use of notation keys according to the definitions in the Reporting Guidelines;
  - Calculates all emissions for which methods are provided in the 2016 EMEP/EEA Guidebook;
  - Uses the 2016 EMEP/EEA Guidebook for all categories;
  - Improves the transparency of the inventory by improving the IIR.

## VII. Effect of revised estimates, technical corrections and adjustments recommended to be approved on the national total and national total for compliance

35. The table below shows differences between submitted inventories in Annex 1 table, rows 141 and 144 and revised national totals after accounting revised estimates, technical corrections and adjustments recommended to be approved. The table shows the direct changes in response to the NECD Review 2018. As no revised estimates and technical corrections were calculated for HMs and POPs the table only shows the main pollutants.

*Table 4: National totals as reported and national totals including revised estimates (RE), technical corrections (TC) and adjustments for NO<sub>x</sub>, NMVOC, SO<sub>x</sub>, NH<sub>3</sub>, PM<sub>2.5</sub><sup>7</sup>*

Description	Reference	Pollutant estimates (kt)			
		2005	2010	2015	2016
<b>NO<sub>x</sub></b>					
National total (row 141)	Annex1, 13/02/2018	1577.03	1357.207	1240.75	1218.294
National total for compliance (row 144)		1577.03	1070.62	960.891	968.67
National total (row 141) including revised estimates and technical corrections accepted by Germany	Calculated using above data	1577.03	1357.207	1240.75	1218.294
National total for compliance (row 144) estimate including revised estimates, technical corrections	Calculated using above data	1577.03	1070.62	960.891	968.67

<sup>7</sup> The tables presented in this report show numbers rounded to three decimal places, although most numbers are available with greater precision. For all calculations, all available decimal places were used. Therefore, the totals shown may slightly differ from calculation results where only three decimals would be taken into account.

Description	Reference	Pollutant estimates (kt)			
		2005	2010	2015	2016
accepted by Germany and adjustments recommended (by TERT) to be accepted by EC					
<b>NMVOc</b>					
National total (row 141)	Annex1, 13/02/2018	1323.61	1230.356	1039.157	1052.142
National total for compliance (row 144)		1323.61	1029.129	832.193	848.005
National total (row 141) including revised estimates and technical corrections accepted by Germany	Calculated using above data	1323.61	1230.356	1039.157	1052.142
National total for compliance (row 144) estimate including revised estimates, technical corrections accepted by Germany and adjustments recommended (by TERT) to be accepted by EC	Calculated using above data	1323.61	1029.129	832.193	848.005
<b>SOx</b>					
National total (row 141)	Annex1, 13/02/2018	473.02	410.74	364.11	355.76
National total for compliance (row 144)		473.02	410.74	364.11	355.76
National total (row 141) including revised estimates and technical corrections accepted by Germany	Calculated using above data	473.02	410.74	364.11	355.76
National total for compliance (row 144) estimate including revised estimates, technical corrections accepted by Germany and adjustments recommended (by TERT) to be accepted by EC	Calculated using above data	473.02	410.74	364.11	355.76
<b>NH<sub>3</sub></b>					
National total (row 141)	Annex1, 13/02/2018	625.08	625.683	670.292	662.574
National total for compliance (row 144)		625.08	585.745	609.683	601.5
National total (row 141) including revised estimates and technical corrections accepted by Germany	Calculated using above data	625.08	625.683	670.292	662.574
National total for compliance (row 144) estimate including revised estimates, technical corrections accepted by Germany and adjustments recommended (by TERT) to be accepted by EC	Calculated using above data	625.08	585.745	609.683	601.5
<b>PM<sub>2.5</sub></b>					
National total (row 141)	Annex1, 13/02/2018	134.97	121.01	103.15	100.78
National total for compliance (row 144)		134.97	121.01	103.15	100.78
National total (row 141) including revised estimates and technical corrections accepted by Germany	Calculated using above data	134.97	121.01	103.15	100.78
National total for compliance (row 144) estimate including revised estimates, technical corrections accepted by Germany and adjustments recommended (by TERT) to be accepted by EC	Calculated using above data	134.97	121.01	103.15	100.78



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

36. Germany did not raise any issues with the calculated estimates in Table 4.

IX. Findings and Conclusions from the Technical Expert Review Team (TERT) for the Review of adjustment applications

37. Germany did submit in 2018 4 **adjustment applications** undergoing review under this contract (see Statement from Germany on the conclusions presented by the TERT).

38. The TERT concluded that the applications do meet all of the requirements laid out in Decision 2012/12 of the Executive Body of the CLRTAP, and therefore recommends that the European Commission accept these adjustment applications. Details on the Review of Adjustment Applications are given in Annex I.

# ANNEX I Review of the 2018 adjustment application of Germany: TERT report for the EC

*Table 5: Summary information on the Submitted Adjustment Applications, Germany, NECD Review 2018*

Source Sector	Years	Pollutant	Application type
1A3b Road transport	2010-2016	NO <sub>x</sub>	Previously accepted
3B Manure management	2010-2016	NO <sub>x</sub>	Previously accepted
3D Crop production and agricultural soils			
3I Agriculture other			
3B Manure management	2010-2016	NM <sub>VOC</sub>	Previously accepted
3D Crop production and agricultural soils			
3D Crop production and agricultural soils	2010-2016	NH <sub>3</sub>	Previously accepted
3I Agriculture other			

## 1 Introduction

39. Article 5.8 of the NECD (Directive (EU) 2016/2284) explains that “The Commission, when exercising its powers under paragraphs 6 and 7 (reviewing the use of flexibilities), shall take into account the relevant guidance documents developed under the LRTAP Convention.” Article 8.4 and Part 4 of Annex IV of the NECD text further specify that Member States that opt for the adjustment flexibility must include supporting information in the Informative Inventory Report, including a demonstration that the use of the adjustment procedure fulfils the relevant conditions set out in Article 5.1 and Part 4 of Annex IV. The minimum supporting information required is highlighted in Part 4.1 of Annex IV (which is based on Part 1, paragraph 2 of the Annex to LRTAP Executive Body Decision 2012/12). In the chapeau of Annex IV it is further specified that adjusted emission inventories should be prepared using the EMEP reporting guidelines (which in its turn contains references to the relevant EB decisions 2012/3 and 2012/12, as amended in 2014/1), while also adding that reliance upon these EMEP reporting guidelines is without prejudice to the additional arrangements specified in Part 4 of Annex IV. Consequently, the review of Adjustment applications under the NECD will in principle follow the process for reviewing Adjustment applications made under the CLRTAP (as presented in relevant EB decisions), however without prejudice to the additional arrangements specified in Part 4 of Annex IV of the new NECD.<sup>8</sup> It allows inter alia the submission of additional information during the review, necessary for a proper and full assessment of the adjustment application.

40. Member States may apply to adjust their inventory data or emission reduction commitments if they are in non-compliance with their emission ceilings established in NEC Directive 2001/81/EC (in accordance with article 21(2) of new NECD). If a Member State applies for more than one adjustment and not all these adjustments are required to bring that Member State into compliance, that Member States should be informed that in accordance with the intent of the adjustment procedure, recommendation for approval will be limited to adjustments necessary to bring compliance and be invited to withdraw one or more of its adjustments. In making an adjustment application, Member States must demonstrate that extraordinary circumstances have

<sup>8</sup> See the following overview and guidance documentation: ECE/EB.AIR/111/Add.1, ECE/EB.AIR/113/Add.1, ECE/AB.AIR/127/Add.1 and ECE/EB.AIR/130).

given rise to revisions to their emissions estimates. These extraordinary circumstances fall into three broad categories:

- a) Emission source categories are identified that were not accounted for at the time when the emission reduction commitments were set; or
- b) For a particular source, the emission factors used to estimate emissions for the year in which emissions reduction commitments are to be attained are significantly different to those used when the emission reduction commitments were set; or
- c) The methodologies used for determining emissions from specific source categories have undergone significant changes between the time when emission reduction commitments were set and the year they are to be attained.

“Technical corrections” and “revised estimates” arise when the review team identifies substantial quality issues with the emissions inventory. The emissions inventory data is revised during the review to address the issue. Consequently, technical corrections and revised estimates change the national emission totals, which can make a specific adjustment no longer necessary or make a specific adjustment incompatible/invalid when applied to the same category for which a technical correction or revised estimate was approved. Adjustment applications that are affected by technical corrections or revised estimates should be reviewed, but the finalised outcome of the work on technical corrections and revised estimates must first be established before the review of the associated adjustment application.

The review of an adjustment application can recommend acceptance or rejection. In the case of a rejection, the recommendation may be accompanied by information explaining that the principle of the adjustment is considered appropriate but that the quantification has not been determined correctly, or it has not been possible to adequately assess the quantification in the time available for the review. Consequently, it may be appropriate for Member States to consider resubmitting selected rejected applications at a future date.

41. Any Member State submitting an application for an adjustment to its inventory is required to notify the European Commission by 15 February at the latest. As explained above the supporting information must be included in the Informative Inventory Report (by 15 March of the same year) including a demonstration that the use of the adjustment procedure fulfils the relevant conditions set out in Article 5.1 and Part 4 of Annex IV. The minimum supporting information required is specified in Part 4.1 of Annex IV.

42. As mandated by the European Union’s National Emissions Ceilings Directive (Directive (EU) 2016/2284) applications for adjustments that are submitted by Member States are subject to an expert review.

43. In 2018 the reviewers undertook a detailed technical review of newly submitted adjustment applications. Information provided regarding adjustments that were accepted in previous years was also reviewed. Reviews are undertaken in cooperation with the EEA and recommendations from the review on the acceptance or rejection of an adjustment are communicated to the European Commission. The European Commission then takes its decision on any adjustment application based on the outcome of the technical assessment completed by the reviewers considering also the effect of technical corrections and revised estimates.

44. The review of submitted adjustments were performed by an expert review team. The team was formed of the experts identified in Table 6.

*Table 6: The 2018 Review team of new and previously accepted adjustment applications*

Role	Sectors	Name
Adjustment lead reviewers	All	Chris Dore Ole- Kenneth Nielsen
Expert reviewers	Energy: Stationary and fugitives	Rianne Dröge Katrina Young
Expert reviewers	Energy: Transport and off-road	Jean-Marc André Giorgos Mellios Tim Murrells Giannis Papadimitriou
Expert reviewers	Industrial processes and product use	Ardi Link
Expert reviewers	Agriculture	Michael Anderl Bernard Hyde Mette Mikkelsen Beatriz Sánchez
Basic checks (Step 1 and 2)	All	Katarina Mareckova Robert Wankmüller

## 1 Review of Adjustments approved prior to 2018

45. Germany had 4 adjustments granted prior to 2018, details of which can be found in **Table 7**. Germany included information on these adjustments in its submission under the National Emissions Ceilings Directive (Directive (EU) 2016/2284) of 13/02/2018, reporting sectoral level data in Annex VII to the reporting guidelines and in line 143 of Annex I. Along with Annex VII, Germany submitted the “Declaration on consistency” with a short summary of recalculations of these granted adjustments. Additional documentation was provided during the review in response to requests from the reviewers. Table 9 lists the documentation provided by Germany.
46. The review of previously accepted adjustment applications focuses on checking that any recalculations performed have been done so using a methodology that follows best practice, and that transparent supporting information has been provided. A check is made that the adjustment is still “necessary” to ensure compliance, but no check is made on the basis of the application - as this would have been checked in detail during the review when the adjustment application was first made.
47. The reviewers noted that no substantial recalculations have occurred and that all supporting information has been provided. The reviewers therefore conclude that the adjustment should continue to be granted.

**Table 7: Conclusions and recommendations from the review team on previously accepted adjustment applications**

Year of first application	Country	Sector	Inventory year	Poll.	Basis of Adjustment	Conclusions text	Recommendation & Impact on National Total <sup>9</sup>
2017	Germany	1A3b Road transport	2010-2016	NO <sub>x</sub>	Significantly different EFs	The TERT reviewed the information submitted by Germany on the previously accepted adjustment for NO <sub>x</sub> from 1A3b. The IIR indicates that the methodology is unchanged from last years' submission although the TERT notes that the adjustments have been recalculated, caused by recalculations made to this sector in the 2018 inventory submission. The magnitude of recalculations in the adjustment figures for 1A3b are in the range of 13-48% depending on the year being considered. The TERT undertook a thorough investigation of the recalculations and note that the increase in magnitude of the adjustments are in line with the increase in the recalculated emission estimates for the years 2010-2015 from the 2018 inventory submission. The TERT understands that this is mainly due to the use of the updated HBEFA 3.3 (2017) transport emissions model which takes into account updated emission factors for Euro 4-6 diesel cars based on new measurements from different sources using PEMS and remote sensing. The TERT did not find it necessary to ask Germany for clarifications or to recalculate the quantification of the adjustment. Following the review of the information made available prior to the review, the TERT concludes that the adjustment does continue to meet the requirements stated in the NECD for an adjustment, and therefore recommends that the European Commission does continue to accept the most recent submission as a valid adjustment for this source and pollutant.	-10.1 % in 2016 <b>Accept</b>
2017	Germany	3B Manure management 3D Crop production and agricultural soils	2010-2016	NO <sub>x</sub>	New Source	The TERT reviewed the information submitted by Germany on the previously accepted adjustment for category 3B, 3D and 3I, for NO <sub>x</sub> for years 2010-2016. The TERT noted that recalculations had been undertaken for the previously reviewed and approved adjustment application with respect to NO <sub>x</sub> emissions from 3D and 3I. The TERT found	-10.4% in 2016 <b>Accept</b>

<sup>9</sup> The national total used in this calculation excludes adjustments and is on the basis of fuel sold. The data are presented for context only, and not for compliance purposes.

		3I Agriculture other				it necessary to ask Germany for clarifications. In response to a question raised during the review for this observation, Germany explained that the rationale for the recalculation was the use of data from the 2016 agricultural census. The TERT agreed with the explanation provided by Germany and concludes that the adjustment does continue to meet the requirements stated in the NECD for an adjustment, and therefore recommends that the European Commission does continue to accept the most recent submission as a valid adjustment for these sources and pollutants.	
2017	Germany	3B Manure management 3D Crop production and agricultural soils	2010-2016	NMVOC	New Source	The TERT reviewed the information submitted by Germany on the previously accepted adjustment for NMVOC under category 3B, 3D. The TERT did not find it necessary to ask Germany for clarifications. The TERT did not find it necessary to ask Germany to recalculate the quantification of the adjustment. Following the review of the information made available prior to the review, the TERT concludes that the adjustment does continue to meet the requirements stated in the NECD for an adjustment, and therefore recommends that the European Commission does continue to accept the most recent submission as a valid adjustment for these sources and pollutant.	-19.4 % in 2016 <b>Accept</b>
2017	Germany	3D Crop production and agricultural soils 3I Agriculture other	2010-2016	NH <sub>3</sub>	Significantly different EFs & New Source	The TERT reviewed the information submitted by Germany on the previously accepted adjustment for category 3D and 3I for NH <sub>3</sub> for years 2010-2016. The TERT noted that recalculations had been undertaken with respect to NH <sub>3</sub> emissions from 3D and 3I. The TERT found it necessary to ask Germany for clarifications. In response to a question raised during the review, Germany explained that the rationale for the recalculation was the use of data from the 2016 agricultural census. The TERT agreed with the explanation provided by Germany. Following the review of the information made available prior to and during the review, the TERT concludes that the adjustment does continue to meet the requirements stated in the NECD for an adjustment, and therefore recommends that the European Commission does continue to accept the most recent submission as a valid adjustment for these sources and pollutant. The TERT recommends that Germany explicitly state the rationale for recalculations associated with previously reviewed and approved adjustments in future submissions.	-9.2 % in 2016 <b>Accept</b>

## 2 Conclusions and Recommendations of TERT concerning adjustment applications

48. The reviewers have undertaken an assessment of the application for a previously accepted adjustments of the NO<sub>x</sub>, NMVOC and NH<sub>3</sub> emissions inventory that was submitted by Germany in 2018. This included sectors for Transport 1A3b and for Agriculture 3B, 3D and 3I.

49. The review of the submitted application followed the guidance provided in the Annex to Decision 2012/12 of the Executive Body of the CLRTAP as amended by Technical Guidance ECE/EB.AIR/130. The findings of the reviewers are described in detail in sections above of this report.

50. **Table 8** below provides a summary of the adjustment applications received from Germany, and the subsequent recommendations made by the reviewers to the European Commission.

*Table 8: Recommendations following the 2018 review of new and previously accepted adjustment applications*

Source Sector	Years	Pollutant	Application type	Recommendation
1A3b Road transport	2010-2016	NO <sub>x</sub>	Previously accepted (first submitted in 2017)	<b>Accept</b>
3B Manure management 3D Crop production and agricultural soils 3I Agriculture other	2010-2016	NO <sub>x</sub>	Previously accepted (first submitted in 2017)	<b>Accept</b>
3B Manure management 3D Crop production and agricultural soils	2010-2016	NMVOC	Previously accepted (first submitted in 2017)	<b>Accept</b>
3D Crop production and agricultural soils 3I Agriculture other	2010-2016	NH <sub>3</sub>	Previously accepted (first submitted in 2017)	<b>Accept</b>

### 3 Information Provided by Germany

51. **Table 9** lists the information provided by Germany in its adjustment application. The information provided by Germany was stored on the EMRT-NECD review platform.

**Table 9: Information Provided by Germany**

Filename	Short description of content
Declaration_Approved_Adjustments_DE_2018.docx	Declaration on consistent reporting of Approved Adjustments
DE_2018_Table_VII_Approved_Adjustments.xlsx	The detailed calculations for the quantification of the 2018 adjustments.
MS_IIR_2016_draft_160315_v4.pdf	The Informative Inventory Report provided by Germany.

52. The reviewers found it necessary to ask Germany for some clarification. This is detailed in **Table 10**.

**Table 10: Additional Information Provided by Germany**

Filename	Short description of content
EMRT-NECD QA Exchange, 11/06/18-12/06/18	The reviewers have asked for more clarification regarding a recalculation in the adjustment for 3D Crop production and agricultural soils for NH <sub>3</sub> . Germany replied with an explanation.



# References and Supporting Documents

- Annex I emission reporting template. Available at [http://www.ceip.at/ms/ceip\\_home1/ceip\\_home/reporting\\_instructions/](http://www.ceip.at/ms/ceip_home1/ceip_home/reporting_instructions/)
- EEA 2018. National Emission Ceilings (NEC) Directive reporting status. Available at: <https://www.eea.europa.eu/themes/air/national-emission-ceilings/nec-directive-reporting-status-2018>
- EU 2018. EU Air Emission inventory review Guidelines. Available at <http://ec.europa.eu/environment/air/reduction/implementation.htm>
- EU 2018, Guidance for TERTs. Available upon request.
- Decision 2012/3 (ECE/EB.AIR/111/Add.1): Adjustments under the Gothenburg Protocol to emission reduction commitments or to inventories for the purposes of comparing total national emissions with them
- Decision 2012/12 (ECE/EB.AIR/113/Add.1): 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
- Decision 2014/1 (ECE/EB.Air/127/Add.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
- EMEP/EEA, 2016 EMEP/EEA air pollutant emission inventory guidebook – 2016 EEA technical report No. 21/2016 European Environment Agency, Copenhagen. Available at: <http://www.eea.europa.eu/publications/emep-eea-guidebook-2016>
- EMEP/EEA Air Pollutant Emission Inventory Guidebook 2013 <http://www.eea.europa.eu/publications/emep-eea-guidebook-2013>
- 2014 Reporting Guidelines (ECE/EB.AIR/125 ) for Estimating and Reporting Emission Data under CLRTAP [http://www.ceip.at/ms/ceip\\_home1/ceip\\_home/reporting\\_instructions/](http://www.ceip.at/ms/ceip_home1/ceip_home/reporting_instructions/)
- ECE/EB.AIR/130: Technical Guidance for Parties Making Adjustment Applications and for the Expert Review of Adjustment Applications, 14 April 2015 [http://www.ceip.at/fileadmin/inhalte/emep/Adjustments/ECE\\_EB\\_AIR\\_130\\_AV\\_for\\_the\\_web.pdf](http://www.ceip.at/fileadmin/inhalte/emep/Adjustments/ECE_EB_AIR_130_AV_for_the_web.pdf)
- NEC Directive 2001, DIRECTIVE 2001/81/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL, of 23 October 2001 on national emission ceilings for certain atmospheric pollutants <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32001L0081>
- 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%3AAOJ.L.2016.344.01.0001.01.ENG>