Chapter 8.2 - Improvements

Improvements since last Submission

- 1.A.3.a: allocation of avgas to both domestic and international flights
- 1.A.3.b vi & vii: revision of emission factors applied for tyre and brake wear and road abrasion
- 2.A.6: revised AD of some products resulting to lower emissions
- 5.D.2: NMVOC emissions from industrial wastewater handling are reported first time.
- 1.A.4: Revision of PAH Emission factors

Improvements planned for future submissions

Possible improvement issues that have been identified so far and will be checked in the future are given below:

Over-all inventory / all source categories

- To prioritise improvements on the basis of the results of the uncertainty analysis, it is planned to determine uncertainty analysis at source category level.

Individual source categories

stationary fuel combustion:

- measurements of POPs and heavy metal in large combustion plants (1.A.1.a)
- revision of SO_2 emission factors (1.A.1.b)
- revision of PAH Emission factors for small combustion plants

mobile fuel combustion:

- implementation of abrasive emissions from tyres, brakes and road surface into TREMOD (1.A.3.b vi + vii)
- validation and revision of approach for abrasive emissions from railways; possible implementation into TREMOD (1.A.3.c)

fugitive emissions:

- emissions from storage of refinery products will be divided up to fuels (under 1.B) and chemical products (2.B)
- emission factors from natural gas transmission will be updated according to results of the UNEP OGMP 2.0 measurement programm (1.B.2.b.iv)

industrial processes:

- collection of AD for titanium dioxide production and calculation of these emissions
- Update of some EF for Glass and Cement industry

Investigated Review Findings

NECD 2020

Aspect	Sector	Finding Sumamry	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	NECD 2020	Implemented	Official Comment for IIR
General	LPS	Improve consistency with the latest ePRTR reporting.						DE-LPS-GEN-2020-0002	Yes	
QA/QC	LPS	Improve coordinates given, check for collisions						DE-LPS-GEN-2020-0004	Yes	
QA/QC	LPS	Make sure each point source reported has unique key build from attributes						DE-LPS-GEN-2020-0003	No	Germany checked this issue and does not see any reason to change the data. It is unclear, why LPS name, GNFR and stack height should function as a key alternative, in particular because the table already provides the ePRTR ID as an unique and valid key.
Aspect	**Sector**	**Finding Sumamry**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**NECD 2020**	**Implemented**	**Official Comment for IIR**
Transparency	2C7a	Improve Transparency for Cd and Pb emissions from copper production						DE-2C7a-2020-0001	Yes	
Transparency	3I	Improve the transparency of the calculations used for NO emissions from storage of digestate from energy crops.						DE-3I-2020-0001	Yes	
Transparency	LPS	Reallocate livestock emissions from GNFR L_AgriOther to K_AgriLivestock						DE-LPS-K-2020-0001	Yes	
Aspect	**Sector**	**Finding Sumamry**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**NECD 2020**	**Implemented**	**Official Comment for IIR**
Consistency	1A4cii	IEF Cd trend since 2007 erratic				DE-1A4cii-2018-0001	DE-1A4cii-2018-0001 (ID reused)	DE-1A4cii-2018-0001 (ID reused)	No	All issues regarding the inconsistency of activity data from the National Energy Balance (NEB) can only be resolved as soon as the ongoing internal revision process launched by the provider of the NEB has been finished.

Aspect	Sector	Finding Sumamry	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	NECD 2020	Implemented	Official Comment for IIR
Consistency	1A4ciii	Large increase in AD from 2015 to 2016				DE-1A4ciii-2018-0001	DE-1A4ciii-2018-0001 (ID reused)	DE-1A4ciii-2018-0001 (ID reused)	No	All issues regarding the inconsistency of activity data from the National Energy Balance (NEB) can only be resolved as soon as the ongoing internal revision process launched by the provider of the NEB has been finished.
Aspect	**Sector**	**Finding Sumamry**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**NECD 2020**	**Implemented**	**Official Comment for IIR**
Completeness	2B6	Include the NOx emissions in the next submission.			DE-2B6-2017-0001	DE-2B6-2018-0001	DE-2B6-2017-0001 (ID reused)	DE-2B6-2017-0001 (ID reused)	No	Germany will look into possible implementations for this in the future. Not reported 2018.
Completeness	2C1	Potential under-estimate of emissions of HCB				DE-2C1-2018-0001	DE-2C1-2018-0001 (ID reused)	DE-2C1-2018-0001 (ID reused)	Yes	Data acquisition for the resolution of this issue will be implemented in the framework of a research project updating several emission factors. The effort is scheduled to start in 2021 and will take about 3 years. Until then, the default emission factor from the EMEP/EEA Guidebook is used.
Completeness	2D3a	Emissions of Hg not estimated					DE-2D3a-2019-0001	DE-2D3a-2019-0001 (ID reused)	No	
Completeness	2D3g	Report PAHs from 2D3g Chemical Products				DE-2D3g-2018-0001	DE-2D3g-2018-0001 (ID reused)	DE-2D3g-2018-0001 (ID reused)	No	A project is planned to collect AD and EF for this emission source with the goal to calculate PAHs emissions. Results will be available in 2021 at the earliest, so emission reporting could not be done before submission 2022.
Completeness	5D2	NMVOC emissions missing although default EFs exist					DE-5D2-2019-0001	DE-5D2-2019-0001 (ID reused)	Yes	Industrial wastewater NMVOC emissions were implemented and are part of the 2021 reporting.
Completeness	GRID	Add gridded emissions of Cd, Pb, Hg, PCDD/F, PAHs, HCB, PCBs to reporting						DE-GRID-GEN-2020-0001	Yes	
Completeness	LPS	Add missing pollutants PAHs, PCBs, PM2.5						DE-LPS-GEN-2020-0001	No	Since these pollutants are not in the ePRTR dataset, Germany cannot report them.
Aspect	**Sector**	**Finding Sumamry**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**NECD 2020**	**Implemented**	**Official Comment for IIR**

Aspect	Sector	Finding Sumamry	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	NECD 2020	Implemented	Official Comment for IIR
Accuracy	2D3a	Rationale for not estimating emissions in category 2D3a and notation key selection				DE-2D3a-2018-0001	DE-2D3a-2018-0001 (ID reused)	DE-2D3a-2018-0001 (ID reused)	No	Germany is in the process of evaluating data to calculate emissions of Hg from the use of fluorescent tubes.
Accuracy	LPS	Check emission data for facility “Heyne & Penke Verpackungen GmbH”						DE-LPS-E-2020-0001	Yes	

NECD 2019

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Transparency	1A1	Presents its NH_3 EF for stationary combustion in the next submission of its IIR, justify the use of these and compare these against the values in 2016 EMEP/EEA Guidebook.			DE-1A1-2017-0001	DE-1A1-2018-0001	DE-1A1-2017-0001 (ID reused)	No	A comparison with default values is not possible
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Consistency	1A4bii	Significant fluctuations in fuel consumption over the time series					DE-1A4bii-2019-0001	No	
Consistency	1A4cii	IEF Cd trend since 2007 erratic				DE-1A4cii-2018-0001	DE-1A4cii-2018-0001 (ID reused)	No	All issues regarding the inconsistency of activity data from the National Energy Balance (NEB) can only be resolved as soon as the ongoing internal revision process launched by the provider of the NEB has been finished.
Consistency	1A4ciii	Large increase in AD from 2015 to 2016				DE-1A4ciii-2018-0001	DE-1A4ciii-2018-0001 (ID reused)	No	All issues regarding the inconsistency of activity data from the National Energy Balance (NEB) can only be resolved as soon as the ongoing internal revision process launched by the provider of the NEB has been finished.
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Comparability	1A4ai	Implied EFs PAHs and PCDD/F are outliers compared to other member states					DE-1A4ai-2019-0001	No	An improvement of PAH Emission factors is planned. Currently a measurement Project is running.
Completeness	1A2a	NE reported for Cadmium although a default EF is available					DE-1A2a-2019-0001	Yes	
Completeness	1A2b	NE reported for some pollutants although default EFs are available					DE-1A2b-2019-0002	Yes	
Completeness	1A2b	NA is reported for HCB 1990					DE-1A2b-2019-0001	No	
Completeness	1A3b	PCB emissions missing for all years although default emission factors are available					DE-1A3b-2019-0001	Yes	emissions calculated based on default EF
Completeness	1A3c	Update notation key from NE to NA					DE-1A3c-2019-0001	Yes	
Completeness	2B3	Include the NO_x emissions in the next submission preferably using a country specific method to account for the specific technologies and abatement equipment applied.			DE-2B3-2017-0001	DE-2B3-2018-0001	DE-2B3-2017-0001 (ID reused)	Yes	
Completeness	2B6	Include the NO_x emissions in the next submission.			DE-2B6-2017-0001	DE-2B6-2018-0001	DE-2B6-2017-0001 (ID reused)	No	Germany will look into possible implementations for this in the future. Not reported 2018.
Completeness	2C1	Potential under-estimate of emissions of HCB				DE-2C1-2018-0001	DE-2C1-2018-0001 (ID reused)	Yes	Data acquisition for the resolution of this issue will be implemented in the framework of a research project updating several emission factors. The effort is scheduled to start in 2021 and will take about 3 years. Until then, the default emission factor from the EMEP/EEA Guidebook is used.
Completeness	2D3a	Emissions of Hg not estimated					DE-2D3a-2019-0001	No	

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Completeness	2D3g	Report PAHs from 2.D.3.g Chemical Products				DE-2D3g-2018-0001	DE-2D3g-2018-0001 (ID reused)	No	A project is planned to collect AD and EF for this emission source with the goal to calculate PAHs emissions. Results will be available in 2021 at the earliest, so emission reporting could not be done before submission 2022.
Completeness	5A	Include NMVOC and $PM_{2.5}$ emissions from 5.A in its next submission.			DE-5A-2017-0001	DE-5A-2018-0001	DE-5A-2017-0001 (ID reused)	Yes	Implemented in 2020 reporting. Although only the reporting of NMVOC and PM2.5 emissions was requested, Germany decided to additionally report PM10 and TSP.
Completeness	5C2	Emission are not estimated for PCDD/F, Pb and Cd although default EFs are available					DE-5C2-2019-0001	Yes	Default-EF used, emissions reported.
Completeness	5D2	NMVOC emissions missing although default EFs exist					DE-5D2-2019-0001	No	Ongoing process
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Accuracy	1A1a	Include the revised estimate of activity data and emissions for biogas in its next submission.			DE-1A1a-2017-0003	DE-1A1a-2018-0001	DE-1A1a-2017-0003 (ID reused)	Yes	Implemented in 2020 submission
Accuracy	2D3a	Rationale for not estimating emissions in category 2D3a and notation key selection				DE-2D3a-2018-0001	DE-2D3a-2018-0001 (ID reused)	No	Germany is in the process of evaluating data to calculate emissions of Hg from the use of fluorescent tubes.
Accuracy	3B	Tier 1 method used for key category					DE-3B-2019-0001	Yes	Implemented in 2020 reporting

NECD 2018

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Transparency	1A1	Presents its NH3 EF for stationary combustion in the next submission of its IIR, justify the use of these and compare these against the values in 2016 EMEP/EEA Guidebook.			DE-1A1-2017-0001	DE-1A1-2018-0001	DE-1A1-2017-0001 (ID reused)	No	A comparison with default values is not possible
Transparency	1A1b	Include the country specific EFs for combustion in refineries in the relating chapter of its IIR to improve transparency.		§ 55	DE-1A1b-2017-0001	DE-1A1b-2018-0001		No	Emission factors are under revision. New emission factors will be included in the IIR following completion of the running refinery project.
Transparency	1A3bi	Incorrect notation keys for activity data				DE-1A3bi-2018-0002		Yes	notation keys replaced by activity data values
Transparency	1A3bv	Incorrect notation keys for HCB and PCB emissions				DE-1A3bv-2018-0001		Yes	'NE' replaced by 'NA' as suggested by the TERT
Transparency	2D3d	Include explanation on recalculation to 1994 in the next submission.			DE-2D3d-2017-0001	DE-2D3d-2018-0001		Yes	Will be reported in submission 2019.
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Consistency	1A4cii	IEF Cd trend since 2007 erratic				DE-1A4cii-2018-0001	DE-1A4cii-2018-0001 (ID reused)	No	All issues regarding the inconsistency of activity data from the National Energy Balance (NEB) can only be resolved as soon as the ongoing internal revision process launched by the provider of the NEB has been finished.
Consistency	1A4cii	Inconsistent AD values NFR vs. IIR				DE-1A4cii-2018-0001		Yes	no more inconsistency between NFR and IIR
Consistency	1A4ciii	Large increase in AD from 2015 to 2016				DE-1A4ciii-2018-0001	DE-1A4ciii-2018-0001 (ID reused)	No	All issues regarding the inconsistency of activity data from the National Energy Balance (NEB) can only be resolved as soon as the ongoing internal revision process launched by the provider of the NEB has been finished.
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Comparability	5C	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				DE-5-2018-0001		Yes	References to research Projects of CS-EF added
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Completeness	1B2aiv	Potential under-estimate of emissions of Hg, Cd, PCDD/F				DE-1B2aiv-2018-0001		No	Metal and PCDD/F emissions are not considered as fugitive. If IE would be used nevertheless one can assume there are such fugitives. Germany suggest to keep the notation key NA.
Completeness	2B3	Include the NOx emissions in the next submission preferably using a country specific method to account for the specific technologies and abatement equipment applied.			DE-2B3-2017-0001	DE-2B3-2018-0001	DE-2B3-2017-0001 (ID reused)	Yes	
Completeness	2B6	Include the NOx emissions in the next submission.			DE-2B6-2017-0001	DE-2B6-2018-0001	DE-2B6-2017-0001 (ID reused)	No	Germany will look into possible implementations for this in the future. Not reported 2018.
Completeness	2C1	Potential under-estimate of emissions of HCB				DE-2C1-2018-0001	DE-2C1-2018-0001 (ID reused)	No	please see table for NECD 2019 (with the same ID)
Completeness	2C3	Include NOx from aluminium production in the next submission to improve completeness and comparability.			DE-2C3-2017-0001	DE-2C3-2018-0002		Yes	Germany carefully assessed the situation regarding this issue and concluded, that no substantial NOx emission are to be expected from this source. But in order to avoid an underestimation Germany implemented the default EF of the emission guidebook 2019.

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Completeness	2C3	Potential under-estimate of emissions of HCB				DE-2C3-2018-0001		Yes	Data acquisition for the resolution of this issue will be implemented in the framework of a research project updating several emission factors. The effort is scheduled to start in 2021 and will take about 3 years. Until then, the default emission factor from the EMEP/EEA Guidebook is used.
Completeness	2D3g	Report PAHs from 2D3g Chemical Products				DE-2D3g-2018-0001	DE-2D3g-2018-0001 (ID reused)	No	A project is planned to collect AD and EF for this emission source with the goal to calculate PAHs emissions. Results will be available in 2021 at the earliest, so emission reporting could not be done before submission 2022.
Completeness	5A	Include NMVOC and PM2.5 emissions from 5A in its next submission.			DE-5A-2017-0001	DE-5A-2018-0001	DE-5A-2017-0001 (ID reused)	Yes	Implemented in 2020 reporting. Although only the reporting of NMVOC and PM2.5 emissions was requested, Germany decided to additionally report PM10 and TSP.
Completeness	5D	Include the estimation of NMVOC emissions from wastewater treatment plant in its next submission.			DE-5D-2017-0001	DE-5D-2018-0001		Yes	
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Accuracy	1A1a	Include the revised estimate of activity data and emissions for biogas in its next submission.			DE-1A1a-2017-0003	DE-1A1a-2018-0001	DE-1A1a-2017-0003 (ID reused)	Yes	Implemented in 2020 submission
Accuracy	2D3a	Rationale for not estimating emissions in category 2D3a and notation key selection				DE-2D3a-2018-0001	DE-2D3a-2018-0001 (ID reused)	No	Germany is in the process of evaluating data to calculate emissions of Hg from the use of fluorescent tubes.

NECD 2017

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Transparency	1A1	Presents its NH3 EF for stationary combustion in the next submission of its IIR, justify the use of these and compare these against the values in 2016 EMEP/EEA Guidebook.			DE-1A1-2017-0001	DE-1A1-2018-0001	DE-1A1-2017-0001 (ID reused)	No	A comparison with default values is not possible
Transparency	1A1a	Improves the transparency of its IIR regarding PM2.5 shares used for each fuel (solid fuels (coal and lignite) and gaseous fuels, but also biomass if relevant).			DE-1A1a-2017-0001			Yes	
Transparency	1A1b	Include the country specific EFs for combustion in refineries in the relating chapter of its IIR to improve transparency.		§ 55	DE-1A1b-2017-0001	DE-1A1b-2018-0001		No	Emission factors are under revision. New emission factors will be included in the IIR following completion of the running refinery project.
Transparency	1A2gviii	Improve the transparency of the IIR to explain its assumptions on the PM2.5 fraction used for each fuel and particularly for liquid fuels, biomass and other fuels.			DE-1A2gviii-2017-0001			Yes	
Transparency	2A1	Include the explanation and rationale for using two sets of activity data to be included in the IIR for the next submission.			DE-2A1-2017-0001			Yes	

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Transparency	2C	Update the SO2 emission factors for 2C5, 2C6 and 2C7a for the next submission to reflect the individual production activities and to include more transparent information on primary vs. secondary production of lead, zinc and copper in the IIR.			DE-2C-2017-0001			Yes	
Transparency	2D3d	Include explanation on recalculation to 1994 in the next submission.			DE-2D3d-2017-0001	DE-2D3d-2018-0001		Yes	Will be reported in submission 2019.
Transparency	3B	Include the information for the proportional of NO-N and N2 and the reference in the IIR to improve transparency.			DE-3B-2017-0002			Yes	
Transparency	3B2	Mention that NFR 3B2 includes lambs and also explain the lower EF NMVOC used for lambs. Furthermore, the TERT recommend that Germany in IIR mentioned that pullets are included in NFR 3B4giv other poultry.			DE-3B2-2017-0004			Yes	
Transparency	3F	Include more information in the IIR for the next submission, referring to the specific law and clarifying from which year the ban came into force. Furthermore, it is recommended to inform whether there are derogations for field burning under certain circumstances or for certain crop types.			DE-3F-2017-0001			Yes	

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Consistency	1A2	Use the right notation keys in the NFR tables for its next submissions. (1A2 Stationary Combustion in Manufacturing Industries and Construction, PM2.5, 2005-2015)			DE-1A2-2017-0001			Yes	
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Comparability	3Da1	Use the updated emission factors available in the 2016 EMEP/EEA Guidebook (Table 3.2) for the next submission.			DE-3Da1-2017-0001			Yes	
Completeness	2B10a	Investigate whether flaring occurs in relation to carbide production e.g. by contacting the single producer of carbide.			DE-2B10a-2017-0002			Yes	Flaring is a common destruction technic in chemical industry. But no information exists to assign flaring quantities to a single installation.
Completeness	2B3	Include the NOx emissions in the next submission preferably using a country specific method to account for the specific technologies and abatement equipment applied.			DE-2B3-2017-0001	DE-2B3-2018-0001	DE-2B3-2017-0001 (ID reused)	Yes	
Completeness	2B6	Include the NOx emissions in the next submission.			DE-2B6-2017-0001	DE-2B6-2018-0001	DE-2B6-2017-0001 (ID reused)	No	Germany will look into possible implementations for this in the future. Not reported 2018.

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Completeness	2C3	Include NOx from aluminium production in the next submission to improve completeness and comparability.			DE-2C3-2017-0001	DE-2C3-2018-0002		Yes	Germany carefully assessed the situation regarding this issue and concluded, that no substantial NOx emission are to be expected from this source. But in order to avoid an underestimation Germany implemented the default EF of the emission guidebook 2019.
Completeness	3Da2b	Include the emission from sewage sludge applied to agricultural soils in the next submission.			DE-3Da2b-2017-0001			Yes	
Completeness	5A	Include NMVOC and PM2.5 emissions from 5A in its next submission.			DE-5A-2017-0001	DE-5A-2018-0001	DE-5A-2017-0001 (ID reused)	Yes	Implemented in 2020 reporting. Although only the reporting of NMVOC and PM2.5 emissions was requested, Germany decided to additionally report PM10 and TSP.
Completeness	5D	Include the estimation of NMVOC emissions from wastewater treatment plant in its next submission.			DE-5D-2017-0001	DE-5D-2018-0001		Yes	
Completeness	5E	Although the Guidebook has methods for car and house fires in Chapter 6, it may be more transparent to include these in Chapter 7 as Chapter 6D is more focused on compost and sludge. The ERT encourages Germany to consider including some of these emissions in the next submissions.	§ 116	§139	DE-5A-2017-0003			Yes	
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Accuracy	1A1a	Include the revised estimate of activity data and emissions for biogas in its next submission.			DE-1A1a-2017-0003	DE-1A1a-2018-0001	DE-1A1a-2017-0003 (ID reused)	Yes	Implemented in 2020 submission

CLRTAP 2010 & 2014

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
General		Provide a PDF version of the IIR for offline use and to better facilitate the review process	§ 6, 9, 11, 28	§ 17				No	The current Wiki platform isn't able to export a whole site to PDF. But we can provide an offline HTML version with full navigation.
General		Use the results of the KCA to prioritise improvements in the inventory		§ 14				Yes	
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Transparency	1A1b	Include the country specific EFs for combustion in refineries in the relating chapter of its IIR to improve transparency.		§ 55	DE-1A1b-2017-0001	DE-1A1b-2018-0001		No	Emission factors are under revision. New emission factors will be included in the IIR following completion of the running refinery project.
Transparency	1A2a\1A2b\2C	For iron & steel, there is a mix of reporting under 1A2a (PM & CO), 2C1 (NOx, SOx, VOC, NH3) and “NE” (HMs and POPs). For non ferrous metals, similar issues are observed. The recommendation is to explain the rationale for reporting in different source categories, as well the rationale for NEs. NE reporting should be avoided as much as possible, e.g. by applying Guidebook Tier 1 EFs.	§ 48, 49					Yes	The reporting in the different source categories is explained in the IIR.
Transparency	1A2gviii	The ERT recommends that Germany include details of the units of AD used in its estimations, as this was not always the case.	§ 51					Yes	
Transparency	1A3b	Explain in more detail the emission calculation for road transport, not only by saying that HBEFA and TREMOD are used but giving more information including an overview of emission factors in the next versions of the IIR.	§ 65	§ 72				Yes	

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Transparency	1A4	Provide more detail on the emission factors used, including their applicability for the different years and sub-categories of the time series. Find EFs to estimate emissions for heavy metals (for example: using tier 1 in the EMEP Guidebook, inventories in other countries).	§ 52					Yes	
Transparency	1B2d	Report in the IIR on what basis emissions from geothermal energy extraction are considered negligible.		§ 59				Yes	
Transparency	2D3	The methodology described in the IIR for solvent and other product use is found to be not transparent. Provide detail on all 37 subcategories, including activity data and emission factors.		§ 18, 96, 97, 98				Yes	The transparency for the solvents used and products used sector in the IIR was much improved in the submission 2016.
Transparency	3B	The ERT recommends including in the IIR information on the complete time series of the activity data, description of emission drivers, recalculations and improvements for the agriculture sector.	§ 86, 94					Yes	
Transparency	3B	Explain the variation in activity data for goats in the IIR.		§ 120				Yes	
Transparency	3B	Provide additional information in the IIR, especially related to: TAN contents, distributions of housing and storage facilities (e.g. for the first and last reporting year), slurry storage systems and the spreading systems applied, corresponding EFs.		§ 117				Yes	
Transparency	5A\5B\5C	Since all incineration is reported under energy, add information about the methodology used for different types of waste incineration under NFR 1. In NFR 6C, use the notation key “IE” instead of “NO”, and to explain the use of the notation key in the IIR.	§ 103, 110, 111, 112	§ 136				Yes	Information on methods used for estimation of energy-related is reported in NFR 1. Germany considers NO to be correct and explains the situation in its IIR. Cremation estimation is explained now.
Transparency		Inaccuracies were found in the use of notation keys, and it is recommended to justify the use of notation keys in the IIR for each particular sector.	§ 38	§ 19				Partly	Information tables for NE & IE were added to the completeness chapter of the current IIR

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Transparency		Provide more detailed information on the rationale for recalculations at a sectoral level, to compliment the information already provided in the recalculation tables per pollutant.	§ 30, 43, 90, 107					Yes	
Transparency		Inaccuracies were found in the use of notation keys, and it is recommended to justify the use of notation keys in the IIR for each particular sector.	§ 38	§ 19				Partly	Information tables for NE & IE were added to the completeness chapter of the current IIR
Transparency		Provide more detailed to explain emission trends, e.g. annual fluctuations and discontinuities of emissions.		§ 21, 78				Yes	
Transparency		Extend the use of a bibliography for some subsectors to all sectors in the IIR.		§ 77				Partly	The amount of recurring references is very small within most source categories. And the total number of references per page is usually quite low. So directly linking to the documents seems like a good way to make sources available to the readers.
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Consistency	2	Ensure time series consistency of TSP emissions between 1990 and later years, and clearly explain in the IIR where and why consistent reporting is not possible.		§ 80				Yes	
Consistency	1A1\1A2	In the IIR in the “Short description” for 1A1 and 1A2, Germany presents a tier 2 or 3 approach. However, during the review Germany indicated that only the tier 2 approach was used. This needs correction in the IIR (was agreed by Germany to do this)	§ 47	§ 54				Yes	
Consistency	1A5	The IIR says Tier 1 method is used for 1A5, but it is actually Tier 2/3. This should be corrected in the IIR.	§ 53					Yes	

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Consistency	2A1\2A2	A time series inconsistency is found which relates to a different reporting structure before 2000. It is recommended to explore the feasibility of harmonizing the methodology.		§ 93				Yes	
Consistency	2D3	Provide emissions for 1990-2005 at a disaggregated level similar to later years, if possible. If not, explain why for the earlier period emissions have been estimated at a more aggregated level. Also clearly document in the case of IE where emissions have been allocated.		§ 100, 101				Yes	The manufacturing industry was the most important branch of the GDR economy. The transformation of the markets and the disappearance of large state-owned enterprises in the course of the German unity led to a dramatic change in the eastern part of Germany
Consistency	3B	The activity data (animal numbers) is coming from various sources and some corrections are being done. It is recommended that Germany includes a table in the IIR showing the livestock numbers from different sources and the type of elaboration/correction that has been done.	§ 94					Yes	
Consistency	3B	The ERT encourages Germany to further improve the consistency of the time series of NH3 for manure management. In chapter 4 of the EMEP/EEA Guidebook 2013 specific methods are provided.		§ 110				Yes	
Consistency	3B	Sheep animal numbers show a step change due to a different reporting time. This should be corrected for and described in the IIR as appropriate.		§ 119				Yes	
Consistency	3B	Check and explain the variation in activity data for horses in the IIR.		§ 121				Yes	
Consistency	3B	Explain how the change in farm practices or the implementation of mitigation measures has affected the time series in the IIR in order to facilitate the assessment of emission trends.		§ 111				Yes	

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Consistency	3B	Explain in the IIR why the NH3 EF for dairy cattle decreased from 2011 to 2012.		§ 122				Yes	
Consistency	3B	Explain in the IIR why the NH3 EF for swine decreased from 1993 to 1994.		§ 123				Yes	
Consistency	3B	Explain in the IIR why the NH3 EF significant changes for different poultry subsectors in the 2000s.		§ 124				Yes	
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Comparability	1A2\2	Germany reports emissions from sugar production in source category 2D2. It is recommended to report these emissions under 1A2e and include a more detailed description of the sub-categories, the methodology used, the source of activity data, the source of EFs and consistency across the time series (1990-2008).	§ 50					Yes	Reporting of NMVOC and PM emissions from sugar production in 2H2 (used to be 2D2) is correct according to the Inventory Guidebook 2016.
Comparability	1A2a\1A4ai\1A4ci\1A5a	Notation key NE is used for (many) heavy metals despite the availability of EFs in the EMEP/EEA Guidebook. If all HM emissions from iron & steel are reported in 2C1, the notation key should be IE.		§ 56				Partly	Implemented for 1A4ai and 1A4ci
Comparability	1A3di(ii)\1A4ciii	Emissions reported as IE. The ERT encourages Germany to make separate emission estimates for these sectors in future IIR reports and, in the meantime, a separate summary table of all categories (fully or partially reported as IE) and where they have been moved would be beneficial.	§ 69					Yes	
Comparability	1A4aii	Emissions for main pollutants were reported as IE. The ERT encourages the Party to investigate further statistical resources for missing estimates in this sector and include a progress report within the next IIR.	§ 67					Yes	
Comparability	1A4bii\1A4cii	Implied NOx emission factors are at the high end of the range when compared with a selected group of countries (AT, BE, DK, ES, FI, FR, GB, IE, IT, NL, NO). The ERT recommends that the Party reviews the emission factors for these two sources and includes an explanation for this issue in the IIR.		§ 66				No	This minor issue has not yet been checked. The inventory compiler will look into this as soon as resources allow.

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Completeness	6	Consider currently missing sources: NH3 emissions from Cats and Dogs, from Zoo animals, and human ammonia emissions, etc.	§ 116					No	
Completeness	1A2a\1A2b\1A4\1B1a	Some emissions are not estimated for some pollutants: heavy metals and POPs for 1A2a, particulates, heavy metals and POPs for 1A2b, heavy metals for 1A4 and NMVOC for 1B1a. The ERT recommends Germany to use the Guidebook default EFs if no other method is available.	§ 36					Partly	
Completeness	1A3a	NH3 reported as NE. Recommendation to investigate the emissions or report as NO if emissions do not occur.	§ 68					Yes	The notation key 'NE' is used only for ammonia from aviation gasoline (as recommended in the 2016 EMEP Guidebook). For jet kerosene, emissions are estimated.
Completeness	1A3ai(i)\1A3aii(i)	Heavy metal emissions are currently not estimated. The ERT recommends that the Party estimates these emissions, using the methodology in the EMEP/EEA Guidebook.		§ 62				Yes	
Completeness	1A3biv\1A4bii	PM10 and PM2.5 emissions are reported as “NE”. The ERT recommends that Germany completes the inventory by estimating these emissions.		§ 63				Yes	
Completeness	1A3bv	Evaporative emissions from running losses (i.e. vapour generated in the fuel tank during vehicle operation) were missing because not considered in the TREMOD model. The ERT recommends to include these in the inventory.		§ 73				No	This issue has not yet been looked into as other model revisions especially regarding a follow-up of 'diesel gate' appear much more relevant, tying up all resources.
Completeness	1A3dii	Pb and Hg emissions are currently not estimated. The ERT recommends that the Party considers the emission factors available in the Guidebook.		§ 64				Yes	

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Completeness	1A4ai\1A4ci\1A5a	HM and POP currently not reported since no consistent dataset is available (partly country specific, partly Guidebook). The recommendation is to describe the issue in the IIR and until it is solved use the Guidebook emission factors despite their recognized uncertainty, rather than reporting NE.		§ 57				Partly	Implemented for 1A4ai and 1A4ci
Completeness	1B1a	In 2010 “NE” is indicated for particulates and “NA” for NMVOC, but the Guidebook has EFs. It is recommended that Germany identifies the type of coal mining, using the EFs from the EMEP Guidebook or other references to estimate emissions for this sector. In 2014 NMVOC was reported as NE, and the ERT recommends Germany to describe why NE is reported (emissions assumed negligible).	§ 54					Yes	
Completeness	2C1	Include emissions for dioxins and heavy metals based on new research project.	§ 80, 81					Yes	
Completeness	3D	The ERT encourages Germany to estimate PM10, and PM2.5 emissions for 3D, in future submissions, following the EMEP/EEA Guidebook recommendations.	§ 98					Yes	
Completeness	5A\5B\5C	The inventory regarding Waste is currently not complete, with missing estimates for several source categories.	§ 102	§ 134, 135				Yes	Industrial wastewater emissions implemented since 2021 reporting. Solid waste emissions implemented since 2020 reporting. Domestic wastewater emissions implemented since 2018 reporting. 5.C completed
Completeness	5A\5B\5D	Improves the completeness of the inventory by estimating emissions from solid waste disposal and wastewater handling.		§ 127				Yes	Solid waste emissions implemented since 2020 reporting. Domestic wastewater emissions implemented since 2018 reporting. Industrial wastewater emissions implemented since 2021 reporting.

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Completeness	5E	Although the Guidebook has methods for car and house fires in Chapter 6, it may be more transparent to include these in Chapter 7 as Chapter 6D is more focused on compost and sludge. The ERT encourages Germany to consider including some of these emissions in the next submissions.	§ 116	§139	DE-5A-2017-0003			Yes	
Completeness		Emissions prior to 1990 are not reported.	§ 27	§ 24				Yes	
Completeness		LPS data were not reported.		§ 10				Yes	
Completeness		A key category analysis (KCA) was missing for the base years (1990 or 2000 for PM) of the pollutants.		§ 13				Yes	
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
Accuracy	1A1b\1A1c\2	Improvement from Tier 2 to Tier 3, using plant-specific data, for some industrial processes including cement production, as well as for large combustion plants (e.g. 1A1b, 1A1c)	§ 19, 41, 45, 46					Partly	Included for large combustion plants, no plant-specific data for cement production
Accuracy	1A3bvi	This source is a key category for Pb and the ERT has noted that the emission factor for brake wear used by Germany was higher than the maximum range quoted by the 2013 Guidebook. Germany is recommended to review the EF, explain where it is coming from in the IIR, and potentially revise to bring in line with the Guidebook.		§ 74				Yes	
Accuracy	1A3dii\1A5b	Review the methodology for national navigation by distinguishing between coastal and inland shipping based on an ongoing research project, as well as explicitly include emissions from military activities.		§ 75, 76				Yes	
Accuracy	2A1	Cement production is a key source for Hg, HCB and for NOx, PM10 and PAH but Tier 1 is used. The ERT encourages Germany to use plant-specific data collected as part of the LCPD, IPPC and E-PRTR to develop a tier 2 or 3 methodology in the near future and to document these in its IIR.	§ 79	§ 88				Yes	Plant-specific data approach is not planned.

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
Accuracy	2D3	Increase the use of information from individual installations that make a high contribution to the key categories, such as car assembly sites and big printing installations.		§ 104				Yes	Emissions caused by the use of solvents and solvent-based products are reported in the relevant source groups. In our methodology we also include the application of solvent-based products in large installations such as those used in automotive series production or large printing systems. The emission data of defined individual plants are thus included in the calculation but cannot be shown and published individually for reasons of confidentiality and data protection.
Accuracy	2L	Include results of ongoing research project to improve from Tier 1 to higher Tier methodology.	§ 82, 83					Yes	
Accuracy	3B	There were errors in the calculation of N excretion rates, it is recommended that Germany corrects this.	§ 97					Yes	
Accuracy	3B	Describe the efforts taken to verify / validate the emission model in the IIR.		§ 118				Yes	
Accuracy		Implement a (qualitative and quantitative) uncertainty analysis and use the results to prioritize improvements to the inventory	§ 20, 24	§ 32, 44e, 85				Yes	
Accuracy		Include a chapter in the IIR with for each source category the foreseen improvements for the inventory		§ 34				Partly	Included for most categories
Aspect	**Sector**	**Finding summary**	**CLRTAP 2010**	**CLRTAP 2014**	**NECD 2017**	**NECD 2018**	**NECD 2019**	**Implemented**	**Official Comment for IIR**
QA/QC		Fully implement the QA/QC system for the air pollutant emission inventory. If possible, implement a unified QA/QC system for reporting to CLRTAP and UNFCCC.	§ 21, 24, 62, 74, 88, 105	§ 37, 44f				No	Ongoing discussion

Aspect	Sector	Finding summary	CLRTAP 2010	CLRTAP 2014	NECD 2017	NECD 2018	NECD 2019	Implemented	Official Comment for IIR
QA/QC		Widen the use of the existing QA/QC system, used for the set of activity data as well as the methods and emission factors for GHGs, for the needs of CLRTAP/NECD inventories and providing further details on its implementation in the IIR (general and sectoral descriptions).	§ 33, 40	§ 16, 69, 84, 87, 103, 105				No	Ongoing discussion
QA/QC		Include information on verification and validation of the inventory in the IIR.		§ 38				No	Ongoing discussion