



Report on the technical expert review of the first biennial transparency report of Germany*

Addendum

Summary

This addendum to the report on the technical expert review of the first biennial transparency report of Germany, conducted by a technical expert review team in accordance with the modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement, contains the results of the review of the consistency of the information submitted by the Party with those modalities, procedures and guidelines. The review took place from 8 to 12 September 2025 in Dessau, Germany.

* In the symbol for this document, 2024 refers to the year in which the biennial transparency report was submitted, not to the year of publication.



Abbreviations and acronyms

2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
2019 Refinement to the 2006 IPCC Guidelines	<i>2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
AD	activity data
BTR	biennial transparency report
C	confidential
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CRF	common reporting format
CRT	common reporting table
CTF	common tabular format
DOC _f	fraction of degradable organic carbon that decomposes
ECOWAS	Economic Community of West African States
EF	emission factor
ETF	enhanced transparency framework under the Paris Agreement
EU	European Union
FAOSTAT	statistical database of the Food and Agriculture Organization of the United Nations
GDP	gross domestic product
GHG	greenhouse gas
HFC	hydrofluorocarbon
HWP	harvested wood products
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
JSON	JavaScript Object Notation
LULUCF	land use, land-use change and forestry
MPGs	modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement
MSW	municipal solid waste
N ₂ O	nitrous oxide
NA	not applicable
NCV	net calorific value
NDC	nationally determined contribution
NE	not estimated
NID	national inventory document
NIR	national inventory report
NO	not occurring
PaMs	policies and measures
QA/QC	quality assurance/quality control
SF ₆	sulfur hexafluoride
TERT	technical expert review team
UA	information not available at the time of reporting
WAM	‘with additional measures’
WM	‘with measures’

Areas of improvement¹ identified during the technical expert review of the Party's first biennial transparency report

Tables 1–20 present the results of the review of the consistency with the MPGs² of the information submitted by Germany in its BTR1. All recommendations and encouragements contained in the tables are for the next BTR or NIR, unless otherwise specified.

A. General reporting provisions

Table 1

Areas of improvement relating to general reporting provisions

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
NA	NA	No areas of improvement identified

B. Greenhouse gas emissions and removals

Table 2

Areas of improvement relating to general findings on greenhouse gas emissions and removals

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
2.G.1	Specified in paragraph 31 of the MPGs Completeness	<p>Germany reported several blank cells in CRTs 2(I), 2(II), 3.B(a), 3.B(b), 3.D, 4.B, 4.D, 4.E, 4(I), 4(III), 4(IV), 5.A and summary 3. In addition, several categories and subcategories were reported as “IE” or “NE” without explanations being provided in CRT 9.</p> <p>During the review, the Party explained that the blank cells and missing explanations for the use of “IE” and “NE” resulted from technical difficulties encountered when transferring data to the CRTs. The Party clarified that its data are imported via JSON files and that the version of the GHG inventory reporting tool used for the submission could not read comments on the notation keys, leading to omissions in the CRTs. The Party confirmed that these issues were addressed, with use of notation keys explained and data transfer improved, for its 2025 inventory submission.</p> <p>The TERT recommends that Germany ensure, to the extent possible, the correct reporting of notation keys and complete reporting in the CRTs in line with the MPGs.</p>
2.G.2	Specified in paragraph 35 of the MPGs QA/QC and verification	<p>The TERT noted several inconsistencies in reported information between the NID and the CRTs, as well as among the CRTs, for example:</p> <p>(a) Energy sector: in CRT 1.A(c) the Party reported a –5.26 per cent difference in CO₂ emissions between the reference and the sectoral approach for 2022, while the difference reported in the NID (table 465, p.854) is –1.28 per cent;</p> <p>(b) IPPU sector: in CRT summary 1, for 2022 the Party reported total emissions as 52,059.64 kt CO₂ eq, while in the NID (table 1, p.62) the value is 52,061 kt CO₂ eq. Similar discrepancies were also observed for 2020;</p> <p>(c) Agriculture sector: in CRT 3.B(a) the percentage of dairy cattle under liquid manure management systems is reported as 59.67 per cent for 2022, while in CRT 3.B(b) this is reported as 67.44 per cent. Similar discrepancies were observed for pasture, range and paddock and for digesters, as well as for other cattle and swine categories;</p> <p>(d) LULUCF sector: in CRT 4(II) the Party reported the area of organic soils under wetlands remaining wetlands as 118.76 kha for 2022, while in CRT 4.D it is reported as 119.58 kha.</p>

¹ As referred to in paras. 7, 8, 146(d) and 162(d) of the MPGs, contained in the annex to decision 18/CMA.1.

² Decision 18/CMA.1, annex.

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
		<p>During the review, the Party explained that these inconsistencies resulted from errors in, incomplete transfers of data to, or incorrect compilations of data within the newly implemented GHG inventory reporting tool. The Party also clarified that the inconsistencies have been resolved between the NID and the CRTs submitted in the 2025 inventory submission.</p> <p>The TERT encourages Germany to ensure consistency between the information reported in the CRTs and the NID, as well as internal consistency within the CRTs.</p>

Table 3

Areas of improvement of the reporting on greenhouse gas emissions and removals – energy sector

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
3.E.1	<p>Specified in paragraph 36 of the MPGs</p> <p>1. General (energy sector) – all fuels – all gases</p>	<p>Germany reported in CRT 1.A(b) data on production, imports, exports, stock changes and apparent consumption for all fuels in energy units (TJ). Footnote 1 to the table specifies that, if consumption data are not reported in physical units, the NCVs should be provided at a similar level of disaggregation as the fuel types in the NID and referenced in the documentation box. For the sectoral approach, the Party indicated in CRTs 1.A(a)s1–1.A(a)s4 that AD were calculated using NCVs. Some information on NCVs is included in NID section 16.7, for example through references to the NCVs published annually by the Working Group on Energy Balances (NID p.928). However, the TERT noted that NCVs were not included in either CRT 1.A(b) or explicitly documented in the NID.</p> <p>During the review, the Party explained that the annual NCVs used in the reference approach for estimating emissions from fuel combustion were not included in the NID because the fuel data from the national energy balance are already available in energy units (TJ). The Party further explained that, as a result, no conversion from physical units is required for compiling the reference approach. However, the Party acknowledged the issue raised by the TERT and confirmed that it will review the provision of information for reporting the NCVs by type of fuel in future submissions.</p> <p>The TERT encourages Germany to provide, to the extent possible, the NCVs for each fuel used in the energy sector in CRT 1.A(b) or document them in the NID.</p>

Table 4

Areas of improvement of the reporting on greenhouse gas emissions and removals – industrial processes and product use sector

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
4.I.1	<p>Specified in paragraph 39 of the MPGs</p> <p>2.B.2 Nitric acid production – N₂O</p>	<p>Germany stated in its NID (section 4.3.2.2, p.300) that it uses selective catalytic reduction and EnviNOx technology in nitric acid plants. For 2021, one nitric acid producer, responsible for minor emission quantities, was unable to provide complete N₂O emission measurements. As a result, the EF for this plant was interpolated using available data for 2020 and 2022. However, no further explanation was provided regarding the methods and assumptions applied for the interpolation, including information on the share of emissions from this particular plant and the abatement technology in place.</p> <p>During the review, the Party explained that this particular producer is responsible for less than 1.6 per cent of the total emissions for category 2.B.2 (nitric acid production) based on an average over the period 2010–2023. The Party further explained that the exhaust gas treatment system at the plant consists of a multi-stage combustion system that has been in operation since its initial commissioning in 1996, with a downstream DeNO_x module also in operation since 1997.</p> <p>The TERT recommends that Germany report information on the methods and assumptions used for gap-filling data for the EF and N₂O emissions for category 2.B.2 (nitric acid production) across the time series, including by providing information on the share of emissions for relevant plants and the abatement technologies in place.</p>
4.I.2	Specified in paragraph 47 of the MPGs	Germany reported the notation key “C” for AD and “NO” for N ₂ O emissions for category 2.E.1 (integrated circuit or semiconductor) in CRT 2(I).A-H, while the NID (table 193, p.409, and section 4.8.3.2, p.425) indicates that N ₂ O emissions from

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
2.E.1	Integrated circuit or semiconductor – N ₂ O	<p>semiconductor manufacturing were estimated. However, the TERT could not find a clear explanation in the documentation box to the CRT or in the NID section on category 2.E regarding how N₂O emissions for this category were considered in the inventory.</p> <p>During the review, the Party clarified that, in previous submissions under the Convention, N₂O emissions for category 2.E.1 were included under category 2.G.3 (N₂O from product uses) because the CRF tables did not allow for them to be reported under category 2.E.1. When transitioning from the CRF tables to the CRTs, category 2.E.1 was added to CRT 2(I).A-H but the corresponding N₂O emissions were not reallocated, which led to the reporting inconsistency.</p> <p>The TERT recommends that Germany reallocate the N₂O emissions reported under category 2.G.3 (N₂O from product uses) to category 2.E.1 (integrated circuit or semiconductor) in CRT 2(I).A-H and include the relevant documentation for the estimates in the appropriate section of the NID.</p>
4.I.3	Specified in paragraph 35 of the MPGs 2.F.1 Refrigeration and air conditioning – HFC-227ea	<p>The TERT noted that, in CRT 2(II).B-Hs2, for HFC-227ea under subcategory 2.F.1.c (industrial refrigeration), the IEF for product manufacturing appears to be incorrectly reported as 100 per cent. For other similar gases reported under this subcategory, the IEF is 1 per cent. This discrepancy suggests that AD or estimated emissions may have been erroneously reported for this gas.</p> <p>During the review, the Party clarified that the AD for HFC-227ea were incorrectly imported into the GHG inventory reporting tool, producing a value 100 times smaller for the IEF than expected. The Party confirmed that the correct IEF is 1 per cent and it is taking steps to correct the reporting error. The Party further clarified that the emissions were reported correctly.</p> <p>The TERT encourages Germany to ensure that information on AD, IEFs and emissions for HFC-227ea under subcategory 2.F.1.c is reported consistently.</p>

Table 5

Areas of improvement of the reporting on greenhouse gas emissions and removals – agriculture sector

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
5.A.1	Specified in paragraphs 21 and 23 of the MPGs 3.G Liming – CO ₂	<p>According to the NID (section 5.8.1, p.518), CO₂ emissions for category 3.G (liming) constitute a key category in terms of both the level of and trend in emissions. In the NID (section 5.8.2, p.518), the Party explained that a tier 1 method was applied for estimating emissions because no country-specific EFs are available for dolomite or limestone, and that no methodological improvements are currently planned for this category.</p> <p>During the review, the Party explained that, according to its key category analysis as described in the NID, category 3.G in the 2023 and 2025 inventory submissions (latest inventory years 2021 and 2023 respectively) lies slightly above the 95 per cent threshold. The Party added that it is still evaluating whether category 3.G will remain a key category in the next key category analysis, as the results may be influenced by emission fluctuations in other categories. The Party indicated that, if its evaluation results in a clear identification of category 3.G as a key category, it will consider the possibility of moving to a higher-tier method for estimating the emissions.</p> <p>The TERT recommends that Germany estimate CO₂ emissions for category 3.G using an appropriate method for key categories in accordance with the decision tree in 2006 IPCC Guidelines (vol. 4, chap. 11, p.11.28), if it is confirmed that this category lies within the threshold for key categories. Meanwhile, the TERT recommends that the Party document in the NID the reasons for not following the relevant decision tree of the 2006 IPCC Guidelines for this category.</p>

Table 6

Areas of improvement of the reporting on greenhouse gas emissions and removals – land use, land-use change and forestry sector

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
6.L.1	Specified in paragraphs 39–40 of the MPGs 4.G HWP – CO ₂	<p>Germany provided AD for HWP for 1990 onward in CRT 4.Gs2. However, the TERT noted that information in this CRT should be provided from the first year for which data are available, which, in accordance with the 2006 IPCC Guidelines (vol. 4, chap. 12.2.3, p.12.17), corresponds to 1961, based on data available from FAOSTAT. Additionally, the data in CRT 4.Gs2 and NID figure 90 (p.721) show an unusual decrease in sawnwood production between 2007 (25,063,000 m³) and 2008 (19,187,000 m³) alongside an increase in exports (from 9,473,140 m³ in 2007 to 12,928,000 m³ in 2008).</p> <p>During the review, the Party explained that both CRT 4.Gs2 and NID figure 90 are based on data from the FAOSTAT 2022 time series. Since all exported goods (in this case, semi-finished wood products) are manufactured domestically, the exported quantities represent a subset of total domestic production. The figure aims to illustrate the total amount of HWP as the basis for calculating the carbon inflow into the HWP pool, which requires subtracting exports from domestic production quantities.</p> <p>The TERT recommends that the Party report AD for HWP starting from the earliest year for which AD are available in CRT 4.Gs2 and explain any significant changes in HWP production or exports within the time series.</p>

Table 7

Areas of improvement of the reporting on greenhouse gas emissions and removals – waste sector

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
7.W.1	Specified in paragraph 39 of the MPGs 5.A.1 Managed waste disposal sites – CH ₄	<p>Germany reported in the NID (p.730) that the figures for landfilled waste quantities were kept constant for 1950–1975 owing to a lack of statistical data. However, it was unclear whether alternative methods were considered or applied to conservatively estimate or extrapolate fluctuations in waste quantities over this period.</p> <p>During the review, the Party clarified that this statement refers only to wood fractions in construction and demolition waste, for which a constant amount of 111 kt/year was assumed to be landfilled over 1950–1975. The Party further explained that most of the wood waste generated during this period was used for heating in residential buildings and therefore rarely disposed of in landfills, making the assumed landfilled amount negligible. The Party also indicated that the wording in the NID will be revised in the next submission to provide clearer and more precise information.</p> <p>The TERT recommends that Germany correct the text in the NID to clarify that the landfilled waste quantities kept constant over 1950–1975 refer only to wood fractions in construction and demolition waste, and include in the NID the rationale underlying the methodological assumptions used to justify the application of constant AD, in order to improve transparency and clarity.</p>
7.W.2	Specified in paragraph 40 of the MPGs 5.A Solid waste disposal on land – CH ₄	<p>Germany reported in the NID (p.731) that improvements in national legislation on waste management prompted a sharp decrease in the share of untreated mixed municipal (settlement) waste sent to landfills after 2005 (from 5.8 kt in 2004 to 2 kt in 2013). However, it was not clear to the TERT whether this significant reduction was partly attributable to waste exports or to other elements of waste management policy, such as increased sorting, recycling or recovery. The TERT noted that waste exports accounted for 7.3–20.5 per cent of total waste between 2006 and 2013.</p> <p>During the review, the Party clarified that data on waste exports are available for 2004–2013, but that figures for municipal waste exports are not itemized. In accordance with the EU waste statistics regulation, mixed municipal waste, waste from markets, bulky waste and municipal waste not otherwise specified are reported together in aggregated statistics. As an illustrative example, the Party explained that waste exports increased sixfold from 23 kt in 2004 to 139 kt in 2005</p>

ID#	Reporting requirement	Description of area of improvement with recommendation or encouragement
7.W.3	Specified in paragraph 39 of the MPGs 5.A Solid waste disposal on land – CH ₄	<p>and, according to its assessment, this increase in waste exports did not significantly contribute to the fluctuation in landfilled waste observed between 2004 and 2005.</p> <p>The TERT recommends that Germany include in the NID information on waste exports, including their impact on the amount of waste disposed of in landfills, together with an explanation of their relevance as part of Germany's waste management policy.</p> <p>Germany reported in the NID (p.735) that it applied a DOC_f value of 0.1 for the wood and straw fraction of solid waste disposed of in landfills, instead of the default value of 0.5 from the 2006 IPCC Guidelines (vol. 5, chap. 3, table 3.1, p.3.14). This decision was based on recent studies and evaluations (Stegmann et al., 2018, pp.172–173). The TERT noted that the 2019 Refinement to the 2006 IPCC Guidelines (vol. 5, chap. 3, table 3) provides three options for DOC_f values depending on the type of waste, and that a value of 0.1 corresponds to less decomposable waste, such as wood.</p> <p>During the review, the Party explained that it took into consideration the recommendation in the 2019 Refinement to the 2006 IPCC Guidelines, which includes a revised DOC_f value of 0.1 for engineered wood products, sawnwood and tree branches. The Party confirmed that its national study, based on exploratory drilling and excavations in German landfills, concluded that wood decomposes only minimally under anaerobic conditions, particularly in the case of massive or thick pieces that are largely inaccessible to microorganisms.</p> <p>The TERT recommends that Germany improve the transparency of its NID by clearly specifying that the DOC_f value applied for the wood and straw fraction of solid waste disposed of in landfills is in line with the 2019 Refinement to the 2006 IPCC Guidelines (vol. 5, chap. 3, table 3) and supported by recent national studies.</p>
7.W.4	Specified in paragraphs 39–40 of the MPGs 5.B.1 Composting – N ₂ O	<p>Germany reported in the NID (p.746) that N₂O emissions from the spreading of compost to agricultural soils are reported under categories 3.D.1.b.iii (other organic fertilizers applied to soils) and 3.D.2 (indirect N₂O emissions from managed soils). According to CRT 5.B, the amount of compost generated in 2022 was 9,092.30 kt from MSW. However, the TERT could not evaluate or replicate the total amount of compost generated in the waste sector or reconcile this amount with the compost quantities and related emissions reported under the agriculture sector, as the information was not presented in a way that allowed consistency checks of AD across sectors or clear cross-referencing between the waste and agriculture chapters of the NID.</p> <p>During the review, the Party provided additional information, including an Excel spreadsheet showing the AD and EFs applied for compost spreading and the related N₂O emissions for the entire time series. For 2022, the Party reported that the total amount of compost spread from biowaste, green waste and digestate amounted to 7,579.73 kt. On this basis, the TERT concluded that the total amount of waste composted in 2022 (including compost generated from MSW), was 16,672.03 kt. The resulting N₂O emissions from compost spreading reported in the Excel spreadsheet amounted to 0.59 kt; however, the TERT could not identify the same value in the relevant CRT under the agriculture sector.</p> <p>The TERT recommends that Germany include in the waste sector chapter of the NID the AD for total amount of compost generated from waste, and clearly indicate the AD for composting reported in the waste sector and those reported elsewhere in the inventory, such as AD for compost spreading in the agriculture sector, and provide clear cross-references to the agriculture sector chapter of the NID where the methods, AD, EFs and estimated emissions from compost spreading are documented.</p>
7.W.5	Specified in paragraphs 39–40 of the MPGs 5.C Incineration and open burning of waste – CH ₄ and N ₂ O	<p>According to the NID (section 7.4, p.755), the fraction of the waste incinerated for energy is reported in the energy sector under category 1.A.1.a (public electricity and heat production), while the remaining emissions from waste incineration are reported in the waste sector under category 5.C.1 (waste incineration). However, in CRT 1.A(a)s4, for the memo item waste incineration with energy recovery (rows 97–99), the Party reported “NO” for AD, CH₄ and N₂O emissions from biomass and fossil fuel waste. As a result, the TERT was not able to evaluate or replicate the total amount of solid waste incinerated, nor to reconcile the amounts reported</p>

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
		<p>under the waste and energy sectors across the entire time series, including performing consistency checks of AD across sectors.</p> <p>During the review, the Party explained that the AD (in TJ) and emissions (CO₂, CH₄ and N₂O) for fossil fuel waste incineration under category 1.A.1.a are presented in CRT 1.A(a)s1 under other fossil fuels (row 28), which in the German inventory comprises only fossil waste. As stated in the NID (p.755), category 5.C covers waste incineration only for crematoriums and bonfires. The Party noted that data for category 1.A.1.a are consistently reported in TJ rather than t for the full time series back to 1990, whereas for category 5.C waste mass (kt) is reported. The Party further noted that there is uncertainty involved in converting from TJ to t owing to variable heating values, and data reported in TJ provide a more suitable basis for estimating CH₄ and N₂O emissions from waste incineration.</p> <p>The TERT recommends that Germany include in the waste sector chapter of the NID the amount of waste incinerated (in mass units) that is reported under the energy sector and provide a cross-reference to the relevant sections of the energy chapter where the methods, AD (in TJ) and EFs and associated emissions are described. In case this is not possible, the TERT recommends that the Party provide a justification in the waste sector chapter explaining the limitations and reasons for not reporting AD for waste incineration with energy recovery in mass units, describe how the data for waste incineration with energy recovery are derived (including the values of AD derived across the time series), provide appropriate cross-references to the relevant sections of the NID, and explain how the Party ensures the reconciliation of these data across both sectors to avoid double counting.</p> <p>The TERT also recommends that the Party ensure consistency in the reporting of waste incineration with energy recovery across the CRTs by replacing “NO” with the relevant data under the memo item for waste incineration with energy recovery in CRT 1.A(a)s4.</p>

C. Information necessary to track progress in implementing and achieving the nationally determined contribution under Article 4 of the Paris Agreement

Table 8

Areas of improvement of the reporting on national circumstances and institutional arrangements

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
NA	NA	No areas of improvement identified

Table 9

Areas of improvement of the description of the nationally determined contribution under Article 4 of the Paris Agreement, including updates

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
NA	NA	No areas of improvement identified

Table 10

Areas of improvement of the reporting of the information necessary to track progress in implementing and achieving the nationally determined contribution under Article 4 of the Paris Agreement

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
NA	NA	No areas of improvement identified

Table 11

Areas of improvement of the reporting on mitigation policies and measures, actions and plans, including those with mitigation co-benefits resulting from adaptation actions and economic diversification plans, related to implementing and achieving the nationally determined contribution under Article 4 of the Paris Agreement

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
11.1	Specified in paragraph 82(b–d) of the MPGs	<p>Germany provided information in CTF table 5 on the descriptions, objectives and type of instrument (columns C, D and E respectively) for PaMs that support the implementation and achievement of its NDC. However, the TERT noted that approximately half of the cells in the “Description” column contain incomplete or unfinished sentences, and 39 cells in the “Objectives” column and 3 cells in the “Type of instrument” column are blank.</p> <p>During the review, Germany acknowledged the issue of incomplete sentences and indicated that the bulk upload reporting tool may not have functioned properly. The Party provided a revised Excel file containing all the previously missing information from the “Description” and “Type of instrument” columns. The Party indicated that the missing data from the “Objectives” column will be provided in the next BTR.</p> <p>The TERT recommends that Germany ensure that the information provided in the “Description”, “Objectives” and “Type of instrument” columns in CTF table 5 is complete and clearly formulated.</p>
11.2	Specified in paragraph 82(e) and (g) of the MPGs	<p>Germany reported on implementation status and gases affected for PaMs in both narrative and tabular format. However, the TERT noted that some information was provided inconsistently. Several measures listed as adopted in CTF table 5 were described as implemented in the BTR1. For example, “Energy efficiency stipulations for climate-neutral new / enlargement structures and federal building renovation” was reported as adopted in CTF table 5 (row 32) but as implemented in the BTR1 (p.76). Although all the mitigation measures in the LULUCF sector were reported as adopted in CTF table 5, the BTR1 includes implementation details such as allocated budgets or outputs for some measures. Additionally, the TERT noted that for “SF₆ voluntary commitment by German industry” (row 22) and “SF₆ bans in line with EU F Gases Regulation 517/2014” (row 43) only HFCs were reported as the gases affected despite SF₆ being in the names of the measures.</p> <p>During the review, Germany acknowledged the inconsistencies in the gases reported as affected by the two SF₆ measures and confirmed that the energy efficiency stipulations measure should be reported as implemented rather than adopted. The Party also explained that the status of implementation of measures in the LULUCF sector is correct as adopted.</p> <p>The TERT recommends that Germany ensure that the information provided in the “Gases affected” column of CTF table 5 is accurate and the information provided in the “Status” column of CTF table 5 is consistent with that in the BTR in its next submission.</p>
11.3	Specified in paragraph 85 of the MPGs	<p>Germany reported expected and achieved GHG emission reductions for PaMs in CTF table 5. However, all the cells in the “2020 Achieved” column contain “NE” without any explanation of why values were not estimated. The TERT noted inconsistencies also between the narrative and tabular formats. Although the BTR1 describes the methodologies and assumptions used to estimate the GHG emission reductions or removals for three mitigation measures (pp.64, 68 and 76), “NE” was reported for them in CTF table 5: “Concept for lead markets for climate-friendly basic materials” (row 46), “Reduction in taxation for company e-cars” (row 15) and “Energy efficiency stipulations for climate-neutral new / enlargement structures and federal building renovation” (row 32). Additionally, for many mitigation measures CTF table 5 provides estimates for GHG emission reductions up to 2050 but the BTR1 (p.52) states that the estimated GHG reductions from measures are presented in five-year intervals up to 2045.</p> <p>During the review, Germany explained that there is no consistent ex post assessment of the mitigation effects of PaMs in Germany and that ex post assessments are available only for some funding programmes that have undergone evaluation. The Party clarified that projections and ex post assessments are not harmonized as they are based on different assumptions and methodological approaches. Germany confirmed that the mitigation impacts of the three</p>

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
		<p>aforementioned PaMs had been assessed and provided the corresponding estimates. The Party also provided a revised statement that the estimated GHG reductions from measures are presented in five-year intervals up to 2050, but effects in the buildings sector are estimated for up to 2040.</p> <p>The TERT recommends that the Party provide, to the extent possible, estimates of expected and achieved GHG emission reductions for its PaMs and ensure consistency between the narrative and tabular formats when presenting information in the BTR on the estimated GHG emission reductions resulting from its PaMs, as well as either provide the currently missing estimates or otherwise provide a clear justification for reporting them as “NE”, for example by making use of custom footnotes to explain the notation key used.</p>
11.4	Specified in paragraph 86 of the MPGs	<p>Germany provided information on the methodologies and assumptions used to estimate the GHG emission reductions or removals resulting from its PaMs. However, the TERT noted that no such information was provided for the measure “Logging ban in old beech forests” in the BTR1 (p.86) despite corresponding estimates being included in CTF table 5 (row 47).</p> <p>During the review, Germany acknowledged that this information was missing and provided the methodologies and assumptions used to estimate the GHG emission reductions or removals resulting from the relevant measure.</p> <p>The TERT recommends that Germany include in its BTR information on the methodologies and assumptions used to estimate the GHG emission reductions or removals for the measure “Logging ban in old beech forests”.</p>

Table 12

Areas of improvement of the summary of greenhouse gas emissions and removals

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
12.1	Specified in paragraph 91 of the MPGs	<p>Germany provided a summary of GHG emissions and removals in CRT 10s6 and the BTR1 (tables 4–6, pp.89–92). The TERT noted slight discrepancies between the data reported in the BTR1 tables and CRT 10s6 across multiple entries. Examples include the CO₂ and N₂O emissions for 2018 in BTR1 table 4, and the figures for the energy, IPPU and LULUCF sectors in BTR1 table 5. Additionally, the TERT identified an incorrect value for total N₂O emissions in the LULUCF sector in BTR1 table 6 (summary for 2022 by gas and sector). It was further noted that the reported CTF table 6 is blank and therefore does not reflect the summary of GHG emissions and removals.</p> <p>During the review, Germany explained that the ETF GHG inventory reporting tool was not functioning properly at the time of uploading the data to CTF table 6. The Party acknowledged the errors in the BTR1 tables and, for BTR1 table 6, provided corrected values for both N₂O and total emissions from the LULUCF sector.</p> <p>The TERT recommends that Germany ensure that its reporting in tabular format (BTR tables and CTF table 6) for the summary of GHG emissions and removals by gas and by sector is complete and consistent with the values reported in CRT 10s6.</p>

Table 13

Areas of improvement of the projections of greenhouse gas emissions and removals

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
13.1	Specified in paragraph 94 of the MPGs	<p>Germany reported projections for the WM and WAM scenarios. It did not provide projections for the ‘without measures’ scenario or explain the absence of such projections.</p> <p>During the review, the Party explained that, since its modelling tools do not support the development of a ‘without measures’ scenario and reporting such a scenario is not mandatory, it opted not to report one.</p> <p>The TERT encourages Germany to either include a ‘without measures’ scenario or provide a concise explanation for not doing so in its BTR.</p>
13.2	Specified in paragraph 95 of the MPGs	<p>Germany presented its projections in CTF tables 7 and 8 starting from 2022, the most recent year included in its NIR that was submitted with the BTR1. The</p>

ID#	Reporting requirement	Description of area of improvement with recommendation or encouragement
13.3	Specified in paragraph 96(a) of the MPGs	<p>projections cover 2022–2050 for the WM and WAM scenarios. However, in figures 5, 7, 10, 12, 14, 17 and 21 of the BTR1, the projections start from 2023 as the final historical year before the start of projected values through to 2050. The BTR1 (p.105) notes that these projections are based on a provisional inventory (for the 2024 reporting year). It is therefore unclear whether the projection model starts from 2022, reflecting Germany’s latest submitted inventory, or from 2023, based on a provisional inventory not included as part of the BTR1 submission. This also creates uncertainty as to whether the historical values for 2020–2022 presented in BTR1 figures 7, 10, 12, 14, 17 and 21 correspond to Germany’s latest submitted national inventory data.</p> <p>During the review, the Party clarified that the projections are based on GHG inventory data covering 1990–2022, which was provided to the modelling consortium in autumn 2023. Although a preliminary inventory estimate for 2023 was available in March 2024 and included in BTR1 figure 21, it was not used for the modelling. Owing to the extreme energy price fluctuations in 2022 caused by the war in Ukraine, 2021 was chosen as the modelling base year instead of 2022. In response to questions on model calibration for the years prior to the base year (since 1990), Germany confirmed that the full historical time series from 1990 to 2022 was used for all models. However, it noted that the extent to which years beyond the base year were used varies across models and cannot be generalized. The Party explained that the first year of projected data is 2024, as reported in BTR1 table 7 (p.96), and that it used the inventory version dated 15 March 2024, with the first projection year based on the preliminary 2023 inventory.</p> <p>The TERT recommends that Germany use the most recent year from its national inventory report submitted with its BTR as the starting point for its projections, and ensure consistency across the CTF tables and BTR figures by clearly indicating the starting year for the projections and the version of the inventory used.</p> <p>Germany provided information on key underlying assumptions and parameters used for its projections in BTR1 table 9 (p.106) and CTF table 11 for until 2050. However, it was unclear whether the reported deflator refers specifically to a GDP deflator, how it was calculated and which methodology was applied. It was also unclear to which parameter(s) the deflator applies. In addition, energy price data for certain fuels – such as biomethane, wood chips (WG20 and WG35), wood pellets, firewood and district heating – were missing for 2050 from both BTR1 table 9 and CTF table 11.</p> <p>During the review, the Party clarified that GDP deflators were applied to projections of primary energy prices, final energy prices and CO₂ prices up to 2022. For 2023 and 2024, specific deflator rates of 5.8 and 2.6 per cent respectively were applied. For 2025–2027, the deflator rate was gradually adjusted to a long-term target of 2.0 per cent, which was maintained up to 2050. The Party acknowledged that the omission of energy price data for 2050 was an unintentional error and provided the missing values during the review for 2050 (in euro cents/kWh): biomethane (13.12), wood chips WG20 (2.39), wood chips WG35 (1.91), wood pellets (5.12), firewood (6.59) and district heating (9.73).</p> <p>The TERT encourages Germany to provide complete data on key parameters used for projections (e.g. including any missing data for energy prices) for the full time series covered by the projections in CTF table 11 and BTR table 9, including relevant definitions and explanation of the assumptions and methodologies used for the presented key parameters (such as the deflator).</p>
13.4	Specified in paragraph 96(c) of the MPGs	<p>Germany indicated that the WM scenario includes all climate policy measures adopted and implemented by 2023. However, CTF table 5 does not list any PaMs as having the status “planned”, so the TERT could not determine which PaMs are included in the WM scenario and which are included in the WAM scenario.</p> <p>During the review, the Party submitted a list of PaMs specifying which are included in each scenario. The Party clarified that CTF table 5 contains only the most relevant PaMs, while the list provided during the review includes additional PaMs not reflected in CTF table 5.</p> <p>The TERT encourages Germany to improve future reporting by clearly identifying in CTF table 5 or in the BTR all the PaMs included in the WM and WAM</p>

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
		scenarios, and ensuring transparent information on the assumptions underlying each scenario.
13.5	Specified in paragraph 97 of the MPGs	<p>Germany did not report in CTF table 10 projections of the key indicator necessary for assessing progress towards its NDC, nor did it provide relevant cross-references to the BTR1 of the EU.</p> <p>During the review, the Party explained that it contributes to the joint EU NDC target and does not have a separate national NDC. At the time of completing the CTF tables, EU-wide emission projections were not available, so the relevant cells were left blank. The Party indicated that, for its next BTR, it intends to provide national-level data in CTF table 10 and include a note in the documentation box clarifying that the data refer only to Germany.</p> <p>The TERT recommends that Germany include projections for its key indicator for assessing progress towards its NDC in CTF table 10, consistently with the information provided in the BTR of the EU.</p>
13.6	Specified in paragraph 98 of the MPGs	<p>Germany reported projections by gas for its WM and WAM scenarios, and projections by sector for its WAM scenario in CTF tables 7 and 8. However, in CTF table 7 the Party did not provide projections by sector for its WM scenario. Also, sectoral projections were not included in Germany’s BTR1.</p> <p>During the review, the Party submitted a complete CTF table 7 and explained that the previously missing sectoral data resulted from a technical issue with the ETF reporting tool, which failed to display data that had already been entered. The Party clarified that the automatically calculated totals in the table confirm that the data had been entered, but it acknowledged that it had not identified the omission of the sectoral data prior to submission.</p> <p>The TERT recommends that Germany ensure that projections for the WM and WAM scenarios are reported by gas and by sector in both the CTF tables and the BTR.</p>
13.7	Specified in paragraph 101 of the MPGs	<p>Germany presented projections in both graphical (figures 5, 7, 10, 12, 14, 17 and 21 in the BTR1) and tabular formats (CTF tables 7 and 8). However, the TERT noted several issues affecting transparency: (1) the legend titles and scenario abbreviations in the figures are in German (e.g. “Projectionsbericht”, “MMS”, “MWMS”), making it difficult to distinguish between the WM and WAM scenarios and between projections prepared for different years (e.g. figure 21, p.94); (2) abbreviations such as “MMS” and “MWMS” are not explained in the text, which may lead to misunderstandings; and (3) the HFC emission values reported in kt CO₂ eq in CTF tables 7 and 8 differ from those presented in table 7 of the BTR1 (pp.96–97) for 2030–2050.</p> <p>During the review, the Party clarified the meaning of the legend titles for the scenario lines in the figures and tables, and confirmed that it will include an English translation of the legends and descriptive text to clearly indicate and explain these scenario lines in future submissions. Regarding the discrepancies in HFC emission values between BTR1 table 7 and CTF tables 7 and 8, Germany clarified that the values reported in the CTF tables are correct and the inconsistencies with the BTR1 table are likely due to transcription errors.</p> <p>The TERT recommends that Germany improve the transparency of its projections by providing clear legend titles and abbreviations in English for all scenarios presented in figures and tables in the BTR (e.g. English titles for the WM and WAM scenarios), and by ensuring consistency between the projected HFC emission values reported in the BTR and CTF tables 7 and 8.</p>

Table 14

Areas of improvement of other information relevant to tracking progress in implementing and achieving the nationally determined contribution under Article 4 of the Paris Agreement

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
NA	NA	No areas of improvement identified

D. Financial, technology development and transfer, and capacity-building support provided under Articles 9–11 of the Paris Agreement

Table 15

Areas of improvement of the reporting on national circumstances and institutional arrangements

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
15.1	Specified in paragraph 119(b) of the MPGs	<p>Germany did not report in its BTR1 the challenges and limitations related to national circumstances and institutional arrangements for reporting on the provision and mobilization of financial support, technology development and transfer, and capacity-building under Articles 9–11 of the Paris Agreement.</p> <p>During the review, the Party explained that reporting on the provision and mobilization of support under Articles 9–11 of the Paris Agreement is subject to methodological and practical limitations, including the large number of projects, the diversity of implementing institutions and data sources, and challenges in identifying and quantifying certain elements in a fully disaggregated manner. The Party indicated that it will continue efforts to improve transparency in this regard for future submissions.</p> <p>The TERT recommends that Germany enhance the transparency of its reporting by providing information on the challenges and limitations encountered in tracking and reporting on support provided and mobilized, including any methodological constraints.</p>

Table 16

Areas of improvement of the reporting on underlying assumptions, definitions and methodologies relating to financial, technology development and transfer, and capacity-building support provided under Articles 9–11 of the Paris Agreement

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
NA	NA	No areas of improvement identified

Table 17

Areas of improvement of the information on financial support provided under Article 9 of the Paris Agreement – bilateral, regional and other channels

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
17.1	Specified in paragraph 123 of the MPGs	<p>Germany provided information on financial support provided and mobilized under Article 9 of the Paris Agreement through bilateral, regional and other channels in CTF table III.1. However, the TERT noted that several rows of the table contain entries only in the “Title of project” column, without additional relevant information on the financial flows reported in the other cells of the table. For example, in CTF table III.1, for 2022, rows 10–1160 lack the necessary detail on financial flows. In addition, the TERT noted that, although from row 1161 onward, the Party provided information on the financial flows in the other cells of the table, information on whether the support contributes to capacity-building and/or technology development and transfer objectives is entirely missing from the table.</p> <p>During the review, Germany confirmed that these omissions were due to reporting issues encountered during the preparation of the CTF tables.</p> <p>The TERT recommends that Germany improve the transparency of the information on bilateral and regional financial support reported in CTF table III.1 by correcting the identified errors, some of which resulted from technical issues encountered during the preparation of the CTF tables using the ETF support reporting tool, completing all relevant fields and ensuring that only information pertinent to the reporting years is included.</p>

Table 18

Areas of improvement of the information on financial support provided under Article 9 of the Paris Agreement – multilateral channels

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
18.1	Specified in paragraph 124(f) and (l–n) of the MPGs	<p>Germany reported financial support provided under Article 9 of the Paris Agreement in CTF table III.2; however, the Party did not specify the sectors and subsectors in accordance with the MPGs, reporting instead “NA” for about 90 per cent of the entries. In addition, the Party did not report information on whether the support contributes to capacity-building and/or technology development and transfer objectives (columns X and Y), nor information on the recipient (column O), instead leaving these columns blank.</p> <p>During the review, Germany confirmed that these omissions were due to reporting issues encountered during the preparation of the CTF tables.</p> <p>The TERT recommends that Germany improve the completeness and transparency of information in CTF table III.2 by reporting sector, subsector, recipient and, where applicable, information on whether activities include support for technology development and transfer and/or capacity-building, or by clearly explaining any data and methodological limitations affecting such reporting.</p>

Table 19

Areas of improvement of the information on technology development and transfer provided under Article 10 of the Paris Agreement

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
19.1	Specified in paragraph 127(a–h) of the MPGs	<p>Germany did not report information on support provided for technology development and transfer under Article 10 of the Paris Agreement in CTF table III.4; instead it reported the notation key “UA”, and the TERT could not identify such information in a comparable tabular format in the Party’s BTR1.</p> <p>During the review, the Party explained that technology transfer support cannot be reported separately from capacity-building support because they are cross-cutting components of its international climate finance and almost all bilateral cooperation projects integrate both, making it difficult to report them as stand-alone categories. Owing to the scale of the support provided, the Party does not report all individual measures; rather, it illustrates its efforts through its broad spectrum of activities, including support for GHG emission reduction, adaptation, technology development and transfer, access to climate finance, and cross-cutting aspects related to reporting under the Convention and the Paris Agreement.</p> <p>The Party provided examples of measures and activities related to support for technology transfer specifically, such as supporting the promotion of a climate-friendly electricity market in the ECOWAS region, investment in sustainable mobility systems in India, an electric battery storage project in Senegal to stabilize the grid and integrate renewables, and transboundary flood risk management in the Drin river basin in the Western Balkans.</p> <p>The TERT recommends that Germany improve the transparency of its reporting on support for technology development and transfer by reflecting, to the extent possible, the relevant information in CTF table III.4, including by drawing on information already provided in the narrative sections of the BTR and by explaining any methodological constraints affecting such reporting.</p>

Table 20

Areas of improvement of the information on capacity-building support provided under Article 11 of the Paris Agreement

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
20.1	Specified in paragraph 129 of the MPGs	<p>Germany did not provide information on capacity-building support provided under Article 11 of the Paris Agreement in CTF table III.5; instead, it reported the notation key “UA”.</p> <p>During the review, the Party explained that capacity-building support cannot be reported separately from technology transfer support because they are cross-cutting</p>

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
		<p>components of its international climate finance and almost all bilateral cooperation projects integrate both, making it difficult to report them as stand-alone categories. Owing to the scale of the support provided, the Party does not report all individual measures; rather, it illustrates its efforts through representative examples. For 2021–2022 Germany reported capacity-building activities in more than 70 countries, including providing targeted support to the African Group for strengthening its role in international climate negotiations, and supporting resilience measures in Somalia to improve food security and conflict prevention.</p> <p>The TERT recommends that Germany further improve the transparency of its reporting and include in CTF table III.5, to the extent possible, quantitative and/or qualitative information on the measures or activities related to capacity-building support implemented or planned since its previous reporting. If the Party considers that certain information is not applicable or not available, the TERT recommends that this be clearly specified in the BTR, noting that reporting in the column entitled “Contribution to capacity-building objectives” of CTF tables III.1 and III.2 may automatically populate CTF table III.5 with the projects that have capacity-building components.</p>

Annex

Documents and information used during the review

A. Reference documents

BTR1 of Germany. Available at <https://unfccc.int/first-biennial-transparency-reports>.

BTR1 CTF tables of Germany. Available at <https://unfccc.int/first-biennial-transparency-reports>.

BTR1 of the EU. Available at <https://unfccc.int/first-biennial-transparency-reports>.

BTR1 CTF tables of the EU. Available at <https://unfccc.int/first-biennial-transparency-reports>.

CRTs of Germany. Available at <https://unfccc.int/first-biennial-transparency-reports>.

“Guidance for operationalizing the modalities, procedures and guidelines for the enhanced transparency framework referred to in Article 13 of the Paris Agreement”. Decision 5/CMA.3. FCCC/PA/CMA/2021/10/Add.2. Available at <https://unfccc.int/documents/460951>.

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at <http://www.ipcc-nggip.iges.or.jp/public/2006gl>.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC. Available at <https://www.ipcc.ch/publication/2013-supplement-to-the-2006-ipcc-guidelines-for-national-greenhouse-gas-inventories-wetlands/>.

IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Geneva: IPCC. Available at <https://www.ipcc.ch/publication/2013-revised-supplementary-methods-and-good-practice-guidance-arising-from-the-kyoto-protocol/>.

IPCC. 2019. *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*. E Buendia, K Tanabe, et al. (eds.). Geneva: IPCC. Available at <https://www.ipcc-nggip.iges.or.jp/public/2019rf/>.

“Modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement”. Annex to decision 18/CMA.1. FCCC/PA/CMA/2018/3/Add.2. Available at <https://unfccc.int/documents/193408>.

NDC of the EU. Available at <https://unfccc.int/NDCREG>.

NID of Germany. Available at <https://unfccc.int/first-biennial-transparency-reports>.

B. Additional information provided by the Party

Responses to questions during the review were received from Dirk Günther and Tobias Vosen (German Environment Agency), including additional material. The following references were provided by Germany and may not conform to UNFCCC editorial style as some have been reproduced as received:

Stegmann R.; Heyer K. U.; Hupe K.; Rettenberger G.; Schneider R. 2023 Review of the methodological basis for determining methane formation in landfills at Federal Environment Agency – Germany PP 189. Available at <https://www.umweltbundesamt.de/publikationen/ueberpruefung-der-methodischen-grundlagen-zur>.