



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

Addendum

Summary

This addendum to the report on the technical expert review of the first biennial transparency report of Australia, 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 Canberra.

* 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
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CRT	common reporting table
CTF	common tabular format
DCCEEW	Department of Climate Change, Energy, the Environment and Water of Australia
EF	emission factor
FullCAM	Full Carbon Accounting Model
GHG	greenhouse gas
HFC	hydrofluorocarbon
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
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
N ₂ O	nitrous oxide
NA	not applicable
NDC	nationally determined contribution
NE	not estimated
NEPS	National Energy Performance Strategy
NGER	National Greenhouse and Energy Reporting
NID	national inventory document
NIR	national inventory report
NVES	New Vehicle Efficiency Standard
PaMs	policies and measures
QC	quality control
TERT	technical expert review team

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 Australia 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 19(b) of the MPGs Further improvements	<p>The TERT commends Australia for establishing a robust inventory reporting system, while noting that identifying the need to update the data and parameters used within the system is a challenge, because the situation of estimating GHG emissions may evolve over time, for example owing to technological improvements. The NID refers to this challenge in different sections but no specific planned improvement to address it was reported, although the Party provided limited information on how the challenge is being addressed through its annual inventory process (NID vol. 1, section 1.2.2.c).</p> <p>During the review, Australia provided information on the comprehensive procedures implemented or planned to address this challenge, which consist of an annual review of previous planned improvements, identification of potential new improvements and agreement on the improvements to be implemented for the next inventory submission.</p> <p>The TERT recommends that Australia include more detailed information on the comprehensive procedures for identifying needs to update the data and parameters used within the existing inventory reporting system in order to better reflect changes in the situation of estimating GHG emissions.</p>
2.G.2	Specified in paragraph 32 of the MPGs Completeness	<p>In its discussion of insignificant emissions, Australia reported “NE” for emissions from agriculture and LULUCF in its external territories as these emissions are likely negligible as Australia’s external territories are largely uninhabited (see NID vol. 1, sections 1.7.3–1.7.4). The TERT noted that Australia did not provide a numerical estimate for these emissions, as required by the MPGs, but indicated that it plans to estimate the likely emission levels for LULUCF to improve completeness.</p> <p>During the review, Australia provided some supplementary information to show that LULUCF emissions in its external territories are negligible, including information on land areas and human impact on land use and land-use change. Australia informed the TERT that it will estimate the likely level of LULUCF emissions using approximated AD and default EFs for the next inventory submission to demonstrate that the emissions are below the significance threshold.</p> <p>The TERT recommends that Australia estimate and report agriculture and LULUCF emissions for its external territories.</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>
2.G.3	Specified in paragraph 39 of the MPGs Other (transparency)	<p>Australia reported that the NGER scheme is the main source for AD, EFs and, in some cases, direct measurements of emissions for the energy, IPPU and waste sectors. The NID (vol. 1, p.18) states that under the NGER scheme companies in those sectors whose energy production, energy use or GHG emissions exceed certain thresholds must report facility-level data to the Clean Energy Regulator. The NID (vol. 1, table 1.2) provides information on inventory categories for which the NGER scheme is not the sole source of data and describes NGER scheme data, methods and compliance in detail (vol. 2, annex 5.1). However, the thresholds for reporting under the NGER scheme and how they affect GHG emission estimates are not clear.</p> <p>During the review, Australia indicated that facilities (also known as plants) must report under the NGER scheme if they exceed the facility or corporate group thresholds for GHG emissions, energy production or energy consumption and provided information on the specific thresholds. Reportable emissions sources under the NGER scheme include combustion of fuels for energy; fugitive emissions from the extraction of coal, oil and gas; industrial processes; and waste management. What a facility is required to report under the NGER scheme is also subject to additional thresholds related to levels of combustion of specific fuels, fuel consumed without combustion, landfill emissions or biofuel combustion and refrigerant emissions.</p> <p>The TERT recommends that Australia include specific information on all relevant thresholds under the NGER scheme, as well as on their effect on emission estimates for the energy, IPPU and waste sectors, to further improve transparency.</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	Specified in paragraph 39 of the MPGs 1.A.1.a Public electricity and heat production – solid, liquid and gaseous fuels, and biomass – CO ₂ , CH ₄ and N ₂ O	<p>Australia reported that it receives NGER scheme AD for all large and medium-sized power stations in the country, and that data are currently available for around 140 fossil fuel power stations. However, information on the share of emissions covered by the NGER scheme in relation to the national total emissions from electricity generation was not provided in the NID.</p> <p>During the review, Australia explained that the NGER scheme data include fuel consumption data at the facility level for 100 per cent of electricity generation from coal, 98.5 per cent from gas, 59.8 per cent from liquid fuels and 62.7 per cent from biofuels, which enhances understanding of uncertainty in the emission estimates, with the majority of the emissions being estimated using NGER scheme data, which are more accurate than industry average data. The remaining AD for electricity generation are sourced from the Australian Energy Statistics, used in combination with country-specific EFs.</p> <p>The TERT recommends that Australia provide information on the shares of emissions from the plants covered by the NGER scheme with respect to the total emissions from public electricity and heat production across the time series in order to enhance transparency.</p>
3.E.2	Specified in paragraphs 20–22 of the MPGs 1.A.3.b Road transportation – liquid and gaseous fuels, and biomass – CO ₂ , CH ₄ and N ₂ O	<p>Australia estimated CH₄ and N₂O emissions from road transportation using a tier 3 model consistently with the 2006 IPCC Guidelines. The model used incorporates disaggregated data on vehicle type, age and year of manufacture of vehicle capital stock, emission control technology, operating mode (cold versus hot) and road type (urban versus non-urban). Emissions are estimated and reported in accordance with the level of disaggregation in the CRTs and 2006 IPCC Guidelines. The Party is investigating opportunities for further improving the accuracy of its tier 3 road transport model by incorporating more highly disaggregated EFs available in Orbital (2010 and 2011). The TERT noted that, because the Orbital reports were published in 2010 and 2011, the data in them may not cover the entire time series, which may affect the accuracy of the emission estimates across the time series.</p> <p>During the review, Australia confirmed that detailed vehicle data related to different environmental standards for the time series are required for the national inventory model for estimating emissions from road transportation.</p>

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
		The TERT encourages Australia to improve the estimates of GHG emissions from road transportation across the time series by collecting more disaggregated data on vehicle types, including data disaggregated by vehicle emission standards, to the extent possible, in order to further improve the accuracy of the tier 3 estimation approach used.

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	Specified in paragraphs 20 and 22 of the MPGs 2.A.1 Cement production – CO ₂	<p>Australia estimated CO₂ emissions from cement production using a tier 2 approach and clinker production data reported by companies. Since 2015–2016, the EF calculation for this category has relied on the three companies operating in the country, two of which report their EFs under method 2 of the NGER scheme using plant-specific data, while the remaining producer reports under method 1 of the NGER scheme, which prescribes the application of a country-specific EF estimated on the basis of 66 per cent calcium oxide and 1.5 per cent magnesium oxide content and a correction factor of 0.010 t CO₂/t for carbon-bearing non-fuel materials. This approach results in an implied EF of 0.537 t CO₂/t clinker, which is higher than the default EF provided in the 2006 IPCC Guidelines (vol. 3, chap. 2).</p> <p>During the review, Australia explained that the two companies reporting under method 2 submitted production-weighted average EFs of 0.520, which is consistent with the IPCC default value. Australia also clarified that, while facilities reporting under method 2 represent a significant proportion of national clinker production (46–48 per cent between 2016 and 2022), it is not clear whether their reported values are representative of all cement production facilities in the country.</p> <p>The TERT recommends that Australia justify and document the use of the country-specific EF reported under method 1 of the NGER scheme, or alternatively adopt the default EF from the 2006 IPCC Guidelines.</p>
4.I.2	Specified in paragraph 29 of the MPGs 2.A.1 Cement production – CO ₂	<p>By comparing the uncertainties associated with the estimates of CO₂ emissions from cement production, as reported by Australia in its current and previous national GHG inventories, the TERT noted an inconsistency between the reported emission estimates and the corresponding uncertainties, noting that the uncertainty values changed although there were no changes in the estimates or explanations in the NID.</p> <p>During the review, Australia explained that the uncertainties are estimated on the basis of the uncertainty values reported under the NGER scheme, and that they were calculated jointly with the uncertainties of the emission estimates for lime production. The TERT noted, however, that the uncertainties for the cement industry should be estimated independently from those for the lime industry (and vice versa).</p> <p>The TERT recommends that Australia estimate the uncertainties of the emission estimates for cement and lime production separately.</p>
4.I.3	Specified in paragraph 35 of the MPGs 2.A.3 Glass production – CO ₂	<p>The AD for glass production reported for 2022 by Australia in CRT 2(I).A-H (170.75 kt) differ from those reported in table 4.2 of volume 1 of the NID (163 kt), while the reported emissions are the same (72.95 Gg CO₂). The TERT noted that this discrepancy results in different implied EFs (0.426 versus 0.447).</p> <p>During the review, the Party explained that the discrepancy arises from the treatment of AD reported by companies under the NGER scheme using the default method (method 1) to estimate emissions from their use of carbonates. The Party also explained that the value presented in NID table 4.2 incorporates a reduction due to the application of assumed fractional purities for reported quantities of calcite and dolomite (0.9 and 0.95 respectively). The application of these fractional purity factors was omitted from the data reported in the CRT.</p> <p>The TERT recommends that Australia correct the inconsistency between the AD reported for glass production in the NID and in the CRT by applying the appropriate fractional purity factors to both data sets, as applicable. The TERT also</p>

ID#	Reporting requirement	Description of area of improvement with recommendation or encouragement
4.I.4	Specified in paragraph 20 of the MPGs 2.B.1 Ammonia production – CO ₂	<p>recommends that Australia enhance QC checks for this category to ensure consistency between the data reported by Australia in the NID and in the CRT.</p> <p>Australia reported emissions from combustion of natural gas for energy purposes in ammonia production under the energy sector. The TERT noted that this reporting approach is not in line with the 2006 IPCC Guidelines (vol. 3, chap. 3, p.3.16, box 3.2), which require the total quantities of oil or gas used (fuel plus feedstock) in ammonia production to be subtracted from the quantity reported under energy use in the energy sector.</p> <p>During the review, the Party clarified that the AD reported for the energy sector are taken from the Australian Energy Statistics and include all natural gas consumption in ammonia production in Australia (both for energy and as feedstock). The Party also clarified that the amount of natural gas used as feedstock and reported under the IPPU sector has been deducted from those AD to avoid double counting.</p> <p>The TERT recommends that the Party report, under the IPPU sector, the emissions from fuel use as feedstock, as well as the emissions from fuel use for energy purposes in ammonia production, and deduct both from the emissions reported for ammonia production in the energy sector to ensure consistency with the 2006 IPCC Guidelines.</p>
4.I.5	Specified in paragraphs 28, 43 and 57 of the MPGs 2.B.8 Petrochemical and carbon black production – CO ₂ , CH ₄ and non-methane volatile organic compounds	<p>Australia estimated and reported emissions of CO₂, CH₄ and non-methane volatile organic compounds originating from petrochemical production and from carbon black, methanol, butadiene, ethylbenzene, ethylene, ethylene oxide, formaldehyde, high-density polyethylene, low-density polyethylene, linear low-density polyethylene, propylene, polypropylene, polystyrene, styrene, polyvinyl chloride and styrene-butadiene rubber production. For this purpose, the Party relied on AD collected by a consulting firm, with information reported up until 2008, with subsequent emissions estimated under the assumption that plant capacities remained unchanged. Through a rapid review, the TERT confirmed that some of this production no longer takes place in the country. For example, the production of carbon black ceased in 2011.</p> <p>During the review, Australia confirmed that the only company producing carbon black reported emissions under the NGER scheme until its closure in financial year 2011–2012. The Party indicated that substantive changes had also occurred in the production of ethylene and styrene. Specifically, two companies had produced ethylene at three facilities: one company ceased operations in the late 2010s, and the two facilities operated by the other company reported under the NGER scheme until their announced closure in 2023–2024.</p> <p>The TERT recommends that Australia ensure time-series consistency in accordance with the 2006 IPCC Guidelines when performing recalculations to update the information regarding petrochemical and carbon black production, incorporating the data collected under the NGER scheme and information for other facilities not covered by the scheme.</p>
4.I.6	Specified in paragraphs 22 and 39 of the MPGs 2.F Product uses as substitutes for ozone-depleting substances – CO ₂	<p>Australia estimated HFC emissions using an emission model that produces estimates of HFC emissions for different subcategories as aggregated quantities in CO₂ eq. The Party estimated and reported in the NID the stock of gases for each subcategory in CO₂ eq. In addition, the Party stated in the NID that the gas species concentrations observed at the Cape Grim monitoring station are used to calibrate gas speciation in the HFC emission model. The TERT noted that the Party did not explain the purpose of applying gas speciation, nor whether this procedure has any impact on the estimated emissions. In addition, the TERT noted that Australia reported in CRT 2(II).B-Hs2 emissions and removals of HFC-23, HFC-32, HFC-125, HFC-134, HFC-134a, HFC-143a, HFC-152a, HFC-227ea, HFC-236fa, HFC-245fa and HFC-365mfc. However, in NID table A5.4.2.1, where the estimates of emissions based on observational data are presented, all these gases are included except HFC-134. It is therefore not clear how Australia derived the AD for this gas reported in the CRT.</p> <p>During the review, Australia explained that speciation refers to the disaggregation of total emissions by individual gas species, a step undertaken only after the total emissions in CO₂ eq have been estimated. The Party clarified that this procedure is applied exclusively for reporting in the CRTs and does not affect the total CO₂ eq</p>

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		emissions reported for these gases. Australia also explained that the speciation fractions for HFC-134 in the inventory were based on historical import data.
		The TERT recommends that Australia enhance the transparency of its reporting by clearly explaining how the speciation is applied across gases, subcategories and the time series and clarifying that the AD reported in the CRT are estimated once total emissions have been calculated by the Party using the emission model.
4.I.7	Specified in paragraph 49 of the MPGs 2.F Product uses as substitutes for ozone-depleting substances – CO ₂	<p>Australia reported in CRT 2(II).B-Hs2 AD for HFC-23, HFC-32, HFC-125, HFC-134, HFC-134a, HFC-143a, HFC-152a, HFC-227ea, HFC-236fa, HFC-245fa and HFC-365mfc across all subcategories. The TERT noted that the main applications of these gases, as indicated in table 7.1 of the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines, do not include some subcategories where AD were reported by Australia. For example, HFC-23, HFC-125, HFC-134a and HFC-236fa are not expected to be used for foam blowing (subcategory 2.F.2), nor are HFC-23, HFC-32, HFC-125, HFC-134, HFC-134a, HFC-143a, HFC-152a, HFC-227ea or HFC-236fa expected to be used for solvents (subcategory 2.F.5).</p> <p>During the review, Australia explained that, as a simplifying assumption, the same speciation fractions were applied for all subapplications of gases within category 2.F for which emissions were estimated. The TERT observed that, although this simplification does not affect the estimate of total emissions for the category, the reported emissions of individual gases in different subapplications are not based on data on the use of those gases in those subapplications.</p> <p>The TERT recommends that Australia improve the methodological approach applied for reporting AD and emissions in the CRT for each species of gas by ensuring that only the gases actually used under each subcategory are reported.</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 21–23 of the MPGs 3.C Rice cultivation – CH ₄	<p>CH₄ emissions from rice cultivation was identified as a key category for 2021–2022. Australia estimated these emissions using a tier 1 method, which is not in line with the 2006 IPCC Guidelines, as indicated in the decision tree in figure 5.2 (vol. 4, chap. 5, p.5.47). The NID (vol. 1, p.251) explains that tier 2 EFs are being considered for incorporation into the inventory when time and resources permit.</p> <p>During the review, Australia explained that an industry-led research programme is under way to develop country-specific EFs (two years of the three-year programme have been completed), with results expected in the coming years, and, in the interim, it is exploring the use of more detailed water regime data to refine its estimates.</p> <p>The TERT notes Australia’s ongoing efforts and encourages the Party to implement a higher-tier method once new data become available in order to enhance the accuracy of the estimates and ensure consistency with IPCC good practice.</p>
5.A.2	Specified in paragraph 44 of the MPGs 3.C Rice cultivation – CH ₄	<p>In the NID (vol. 2, table A2.3), Australia reported the results of a quantitative uncertainty assessment for rice cultivation using approach 1 and expert judgment, resulting in an estimated uncertainty of ± 50.2 per cent. However, it was not clear to the TERT how this value was derived.</p> <p>Australia clarified that the uncertainty of 50.2 per cent reported in table A2.3 of the 2022 NID is an error and the correct value is 11.18 per cent, derived from expert estimates of ± 5 per cent uncertainty for the AD and ± 10 per cent uncertainty for the EF, resulting in a combined uncertainty of ± 11.18 per cent using approach 1 from the 2006 IPCC Guidelines. Australia also noted that the correct value was reported in its 2023 NIR.</p> <p>The TERT recommends that Australia transparently report the correct uncertainty information for rice cultivation, including the expert judgment applied and references for the data sources used.</p>
5.A.3	Specified in paragraph 20 of the MPGs	The 2006 IPCC Guidelines (vol. 4, chap. 11, p.11.7, equation 11.1) provide a methodology for estimating N ₂ O emissions from flooded rice soils using an EF

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
	3.D.1.a Inorganic N fertilizers – N ₂ O	<p>different from that for other soils. It is not clear from the NID whether Australia reported these emissions separately or included them in the emission estimates for another source category, estimated using the same EF as for non-flooded crops. If the latter, the resulting estimate of N₂O emissions from flooded soils would not be accurate.</p> <p>During the review, Australia explained that the current inventory does not distinguish between flood-irrigated land and land subject to other irrigation systems such as drip or sprinkler. The Party is considering applying the default EF from the 2019 Refinement to the 2006 IPCC Guidelines for N inputs to flooded rice production (0.004 kg N₂O–N/kg N), on the basis of industry data on the extent of flooded areas and fertilizer use, for estimating these emissions for future inventory submissions.</p> <p>The TERT recommends that Australia report N₂O emissions from flooded rice soils under direct N₂O emissions from managed soils, in line with the 2006 IPCC Guidelines (vol. 4, chap. 11, p.11.7, equation 11.1).</p>
5.A.4	Specified in paragraph 47 of the MPGs 3.D.1.b.iii Other organic fertilizers applied to soils – N ₂ O	<p>The TERT noted that, in CRT 3.D, “NE” was reported for AD for other organic fertilizers applied to soils; however, it also noted from the literature that the production and use of compost in agriculture are common practices in Australia (see, e.g., Australian Economic Advocacy Solutions, 2021; DCCEEW, 2023; and Zhang et al., 2025).</p> <p>During the review, Australia informed the TERT that compost is the primary additional source of N applied to agricultural soils in Australia not already included in the inventory, and that the quantity of compost used in agriculture has increased in recent years. Australia explained that N₂O emissions from compost application to soils are not currently included in the inventory as AD and representative N content measurements are not available.</p> <p>Given that compost may represent a relevant source of N₂O emissions in the country, the TERT encourages Australia to collect the necessary AD to estimate N₂O emissions from compost in line with the 2006 IPCC Guidelines (vol. 4, chap. 11, p.11.7, equation 11.1).</p>
5.A.5	Specified in paragraphs 21–23 of the MPGs 3.H Urea application – CO ₂	<p>CO₂ emissions from urea application was identified as a key category for 2021–2022 and the tier 1 method was used to estimate the emissions, which is not in line with the decision tree in figure 11.5 of the 2006 IPCC Guidelines (vol. 4, chap. 11, p.11.33). The NID (vol. 1, p.272) explains that the Party will investigate the possibility of using country-specific information to estimate EFs for the category.</p> <p>During the review, Australia explained that the tier 1 method reflects the theoretical maximum emissions from urea hydrolysis and therefore does not result in an underestimation of emissions for this category, while noting that no domestic research has yet been conducted to develop a country-specific EF. Australia stated that the default IPCC EF of 0.2 t CO₂-C/t urea applied is consistently used by other Parties included in Annex I to the Convention.</p> <p>The TERT recommends that Australia report on its progress in developing country-specific EFs for this category, including on the methodologies, and encourages Australia to incorporate these EFs, once developed, into a tier 2 method in order to improve the accuracy of the relevant estimates.</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 34–35 of the MPGs Land representation	<p>The TERT observed some discrepancies in land areas reported between CRT 4.1 and CRTs 4.A, 4.B, 4.C and 4.E, in particular concerning total areas and the areas of mineral soils and of organic soils, noting that in these tables the total area should equal the area of mineral soils plus the area of organic soils by subcategory.</p> <p>During the review, Australia explained that the CRTs were manually compiled because the CRT reporting tool was not available at the time. This significantly decreased the time available for QC procedures before the submission date of 12 April 2024, leading to inconsistencies between the area totals reported in CRT 4.1</p>

ID#	Reporting requirement	Description of area of improvement with recommendation or encouragement
6.L.2	Specified in paragraphs 29 and 44 of the MPGs 4. General (LULUCF)	<p>and CRTs 4.A, 4.B, 4.C and 4.E. Australia confirmed that this inconsistency has since been resolved in its 2025 submission, supported by the CRT reporting tool, noting that the tool made the tracking, managing and QC of inputs easier compared with the manual compilation of the CRTs.</p> <p>The TERT recommends that Australia allow sufficient time for adequate category-specific QC procedures within its inventory preparation process in order to eliminate any discrepancies in land areas reported between CRT 4.1 and CRTs 4.A, 4.B, 4.C and 4.E.</p>
6.L.3	Specified in paragraphs 39 and 55 of the MPGs 4. General (LULUCF)	<p>There are some LULUCF categories for which only a qualitative estimate of uncertainty was reported by Australia. In particular, for mangrove forest land converted to settlements and for seagrass removal, Australia reported that a formal uncertainty analysis is not yet available.</p> <p>During the review, Australia informed the TERT that it has recently initiated a review of uncertainty analysis methodology for the LULUCF sector in collaboration with Australia's national science agency, the Commonwealth Scientific and Industrial Research Organisation. The project will include assessment of both parametric and structural uncertainty within FullCAM, as well as of the uncertainty of input data. Sensitivity and Monte Carlo analyses will be used to investigate the impact of key parameters. The analysis will inform the methodologies used for assessing uncertainties across all LULUCF categories, including for mangrove forest land converted to settlements and seagrass removal, which will be available by June 2026, and implementation of uncertainty assessments within the FullCAM system will then commence. Australia expects to begin updating its quantified uncertainty estimates for LULUCF categories as from the 2027 inventory submission.</p> <p>The TERT recommends that Australia provide quantitative estimates of uncertainty for all LULUCF categories. Noting that Australia has initiated a review of its LULUCF uncertainty analysis methodology and expects to begin updating the quantified uncertainty estimates for LULUCF categories as from the 2027 inventory submission, the TERT encourages Australia to report on the progress of that review.</p>
6.L.4	Specified in paragraph 55 of the MPGs 4. General (LULUCF)	<p>As part of its reporting on emissions from natural disturbances, Australia reported that the time frame for live biomass recovery following temperate forest wildfires is between 10 and 15 years (see NID vol. 1, p.301), but also reported that it is projected to take an extended period without further disturbance for average net emissions to equal zero (see NID vol. 1, p.312). It was not clear to the TERT what is meant by "an extended period" in this context.</p> <p>During the review, Australia provided further information on recovery rates following natural disturbances. Australia provided forecasts for the recovery of natural disturbance emissions in the NID (vol. 1, table 6.3.4, p.305, and table 6.3.5, p.312). In the event that there are no further natural disturbances, it is predicted that by 2035 approximately 95 per cent of CO₂ that has been emitted by all natural disturbances from 1989–1990 to 2021–2022 will have been recovered in regrowing vegetation (1,031.42 Mt CO₂ of the total 1,089.70 Mt CO₂). Biomass recovery from forest fires is modelled in FullCAM using the biomass recovery function, as outlined in the NID (vol. 2, p.221), which calculates the recovery time for each location dependent on the disturbance history and level of depletion, up to a maximum time of recovery of 60 years for live biomass losses in temperate forests due to wildfire. Between 10 and 15 years is the indicative biomass recovery period after a single fire event without further disturbances.</p> <p>To increase transparency, the TERT recommends that Australia improve its description of the methodology and assumptions used for estimating emissions from natural disturbances, in particular by being more precise regarding the biomass recovery rates after wildfires on managed land.</p> <p>Regarding natural disturbances, Australia reported that, when fires are detected, impacts on all pools except soil carbon are modelled and that further research is required for estimating the impacts of fires on soil carbon (see NID vol. 1, p.300). The TERT noted that the 2006 IPCC Guidelines (vol. 1, table 1.1) cover five carbon pools, including soil carbon.</p>

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
		<p>During the review, Australia informed the TERT that research into soil carbon dynamics in response to fires in Australia is not being prioritized as part of the inventory improvement programme. Soil carbon may increase or decrease in response to disturbances depending on fire intensity affecting the combustion or conversion of live biomass to litter and debris following fire and impacts of erosion. At present, data are insufficient to confidently estimate the direction or magnitude of this response using current modelling systems.</p> <p>The TERT encourages Australia to estimate the impact of natural disturbances on soil carbon in order to improve the completeness of its estimates of emissions from natural disturbances. Until estimates are available, the TERT encourages Australia to provide further information on the potential impacts of fire on soil carbon.</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 29 of the MPGs 5. General (waste)	<p>The NID (vol. 2, p.24) provides quantitative uncertainty estimates for the waste sector, covering both the starting year of the time series and the latest reporting year. However, the qualitative discussion of these uncertainties remains limited, particularly regarding their implications for the emission estimates and trends and overall inventory reliability.</p> <p>During the review, Australia explained that uncertainty calculations are based on constant inputs and the approach used is consistent with the 2006 IPCC Guidelines and noted that additional qualitative information on waste sector uncertainty will be included in the next inventory submission.</p> <p>The TERT recommends that Australia provide a more comprehensive qualitative discussion of uncertainty for the waste sector, including how the uncertainties influence the emission estimates, the assumptions underlying the calculations and inventory quality.</p>
7.W.2	Specified in paragraph 35 of the MPGs 5. General (waste)	<p>The NID (vol. 2, p.17) provides a link to detailed uncertainty tables in Excel format, including tables A2.2, A2.3, A2.4 and A2.5. As requested by the TERT, Australia provided a detailed uncertainty calculation file for the waste sector, which is consistent with the uncertainty tables available via the link. However, the values reported in NID table A2.5 (vol. 2, p.24) appear inconsistent with those in the calculation file.</p> <p>During the review, Australia clarified that this discrepancy was the result of a transcription error during the report compilation process. The Party confirmed that the detailed uncertainty calculations provided in the file are correct and were used to generate the overall uncertainty estimates for the inventory, and that the incorrect data in NID table A2.5 did not affect these calculations. The Party noted that this issue has since been corrected in the 2025 NIR.</p> <p>The TERT encourages Australia to continue applying appropriate QC procedures to ensure that the reported values in the NID for the waste sector are consistent with the underlying quantitative uncertainty calculations.</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 85 of the MPGs	<p>Australia reported estimates of expected and/or achieved GHG emission reductions for 19 PaMs in CTF table 5. Explanations for not reporting GHG emission reduction estimates were provided for 51 PaMs reported as “NE” in CTF table 5. However, these explanations refer exclusively to federal-level PaMs. For the state-administered PaMs reported as “NE”, explanations for not reporting the GHG emission reductions were not provided in CTF table 5 or in the BTR1.</p> <p>During the review, Australia explained that, while gathering information on PaMs from state-level administrations, it chose not to overburden them with additional requests owing to the high volume of concurrent reporting activities. The Party noted that, for the BTR2, it intends to streamline its process for gathering information from relevant state authorities with the aim of enhancing the transparency of its reporting while minimizing the administrative burden on those authorities.</p> <p>The TERT recommends that Australia provide quantitative estimates of GHG emission reductions for PaMs, to the extent possible, or provide explanations for not reporting them.</p>
11.2	Specified in paragraph 86 of the MPGs	<p>Australia did not report the methodologies and assumptions used to estimate the expected and/or achieved GHG emission reductions or removals for two major federal PaMs (the NVES and the NEPS) or for the state-administrated PaMs.</p> <p>During the review, Australia provided information on methodologies and assumptions used for estimating emission reductions for the NVES and the NEPS. The NEPS should be regarded as an enabling framework, with abatement estimations supplied by individual programmes. The 1,754 kt CO₂ reported as the expected reduction for 2030 represents the abatement estimated for one such programme, the Greenhouse and Energy Minimum Standards. Detailed explanations are available in the 2023 report on the 2022 Greenhouse and Energy Minimum Standards data modelling project (DCCEEW, 2023). The emission reduction impact of the NVES is estimated as the difference between a ‘business as usual’ scenario without the NVES and an ‘NVES scenario’, with the assumptions outlined in the BTR1 (section 2.16.1.2). The emission impact is from reduced emissions from fuel combustion in transport.</p> <p>The TERT recommends that the Party provide, to the extent possible, detailed descriptions of the methodologies and assumptions used to estimate the GHG emission reductions or removals for each action, policy or measure, where such impact is estimated.</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>
NA	NA	No areas of improvement identified

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 96(d) of the MPGs	<p>Australia did not provide a sensitivity analysis for its projections in its BTR1.</p> <p>During the review, Australia explained that it prioritizes its resources for developing ‘with measures’ projections, disaggregated by sector and GHG. It emphasized its ongoing efforts to enhance sectoral modelling to better capture the impact of major government policies within these projections. Furthermore, Australia reaffirmed its commitment to continuously improving the transparency and completeness of its reporting and indicated its intention to include a sensitivity analysis in its BTR2.</p> <p>The TERT encourages the Party to provide a sensitivity analysis for its projections, together with a brief explanation of the methodologies and parameters used.</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>
NA	NA	No areas of improvement identified

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>
16.1	Specified in paragraph 121(p) of the MPGs	<p>Australia did not report in its BTR1 information on how it effectively supports developing countries in achieving their country-driven strategies and NDC targets while implementing the Paris Agreement. Australia reported only case-specific details of support provided to developing countries.</p> <p>During the review, Australia explained that it employs a three-tier performance indicator framework to monitor and assess its contribution to development through its provision of support to developing countries for climate change mitigation and adaptation. However, it does not explicitly measure the effectiveness of its aid against recipient countries’ NDC implementation. Given that Australia’s support is delivered alongside that of numerous other donors – and that recipient countries lead and coordinate these efforts – such direct measurement is challenging. Australia noted that, during the reporting period, coordination mechanisms were in place to align its assistance with recipient country priorities. These mechanisms have since been strengthened through the introduction of development partnership plans, tailored to each recipient country. These plans articulate a long-term vision for how</p>

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
		<p>Australia's development programme will address critical needs and promote sustainable development.</p> <p>The TERT recommends that the Party provide detailed information on how it seeks to ensure the effectiveness of its efforts to support developing countries in achieving their country-driven strategies and NDC targets while implementing the Paris Agreement.</p>

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(b) and (i–k) of the MPGs	<p>The TERT noted that in CTF support table III.1 for 2021 columns related to the face value of the support provided and its contribution to technology development and transfer objectives are empty and explanations were not provided. Similarly, in CTF support table III.1 for 2022, columns related to contribution to capacity-building and technology development and transfer objectives were left empty.</p> <p>During the review, Australia explained that the columns were left blank because there was no relevant information to put in them.</p> <p>The TERT recommends that the Party provide in the CTF support tables, to the extent possible, available information on the amount of support provided (face value), sectors and subsectors addressed, and contribution to capacity-building or technology development and transfer objectives, or clearly indicate if such information is not relevant or such details are not available, for example using appropriate notation keys in the CTF support tables or using custom footnotes and/or providing an explanation in the BTR.</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(m–n) of the MPGs	<p>The TERT observed that in CTF support table III.2 for 2021 columns related to subsectors addressed, and contribution to capacity-building and technology development and transfer objectives were left empty without any notation keys or explanation for the omission in the BTR1 or footnotes to the CTF table. Similarly, in CTF table III.2 for 2022, the column related to contribution to technology development and transfer objectives was left empty.</p> <p>During the review, Australia explained that the columns were left blank because there was no information to put in them.</p> <p>The TERT recommends that the Party provide in the CTF support tables information on subsectors addressed and contribution to capacity-building or technology development and transfer objectives in relation to the support provided, or clearly indicate if such information is not relevant or such details are not available, for example using appropriate notation keys in the CTF support tables or using custom footnotes and/or providing an explanation in the BTR.</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>
NA	NA	No areas of improvement identified

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>
NA	NA	No areas of improvement identified

Annex

Documents and information used during the review

A. Reference documents

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

BTR1 CTF tables of Australia.

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

CRTs of Australia. 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 Hiraiishi, 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. 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>.

NID of Australia, volumes 1 and 2. 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 Carrie Fleming (DCCEEW of Australia), including additional material. The following references were provided by Australia and may not conform to UNFCCC editorial style as some have been reproduced as received:

Australian Economic Advocacy Solutions. 2021. *Australian Organics Recycling Industry Capacity Assessment: 2020-21*. Available at: <https://www.dcceew.gov.au/environment/protection/waste/publications/australian-organics-recycling-industry-capacity-assessment-2020-21>.

DCCEEW, 2024, *National Greenhouse and Energy Reporting Act 2007*, Latest version October 2024, C2024C00572 (C26)14

DCCEEW, 2023, *Report on GEMS Data Modelling Project 2022*. Available at: [https://www.energyrating.gov.au/sites/default/files/2024-02/GEMS Data Modelling Project 2022.pdf](https://www.energyrating.gov.au/sites/default/files/2024-02/GEMS%20Data%20Modelling%20Project%202022.pdf).

Orbital Australia. 2010. “Emissions Factor Derivation from NISE2 Measurements of Vehicles from the Australian Fleet.” Internal report to the Department of Climate Change and Energy Efficiency.

Orbital Australia. 2011. “Preparation of Weighted GHG Results from Additional Data Sources.” internal report to the Department of Climate Change and Energy Efficiency.

Zhang, et al. 2025. *Microplastic in Australian processed organics: Abundance, characteristics and potential transport to soil ecosystem*. Journal of Environmental Management. Available at:
<https://www.sciencedirect.com/science/article/pii/S0301479725003354>.
