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Report on the individual review of the annual submission of Australia submitted in 2016*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information required under Article 7, paragraph 1, of the Kyoto Protocol, with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2016 annual submission of Australia, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 5 to 10 September 2016 in Bonn, Germany.

* In the symbol for this document, 2016 refers to the year in which the inventory was submitted, not to the year of publication.

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Contents

I. Introduction[1]

1. This report covers the review of the 2016 annual submission of Australia organized by the UNFCCC secretariat, in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol" (decision 22/CMP.1, as revised by decision 4/CMP.11) (hereinafter referred to as the Article 8 review guidelines). As indicated in the Article 8 review guidelines, this review process also encompasses the review under the Convention, as described in the "Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention" (hereinafter referred to as the UNFCCC review guidelines) and particularly Part III, "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention". The review took place from 5 to 10 September 2016 in Bonn, Germany, and was coordinated by Ms. Suvi Monni and Mr. Pedro Torres (UNFCCC secretariat). Table 1 provides information on the composition of the expert review team (ERT) that conducted the review of Australia.

Table 1
Composition of the expert review team that conducted the review of Australia

Area of expertise	*Name*	*Party*
Generalist	Mr. Ricardo Fernandez	European Union
	Mr. Michael Strogies	Germany
Energy	Mr. Jerome Elliott	Bahamas
	Ms. Carmen Meneses Lopez	Bolivarian Republic of Venezuela
	Mr. Anand Sookun	Mauritius
	Ms. Songli Zhu	China
IPPU	Ms. Valentina Idrissova	Kazakhstan
	Mr. Kakhaberi Mdivani	Georgia
Agriculture	Ms. Marta Alfaro	Chile
	Mr. Yuriy Pyrozhenko	Ukraine
LULUCF	Mr. Javier Fernandez	Costa Rica
	Mr. Vladimir Korotkov	Russian Federation
	Ms. Diana Marcela Vargas	Colombia
Waste	Ms. Maryna Bereznytska	Ukraine
	Mr. Ching Tiong Tan	Malaysia

[1] At the time of publication of this report, Australia had submitted its instrument of ratification of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

Area of expertise	*Name*	*Party*
Lead reviewers	Mr. Ricardo Fernandez	
	Ms. Songli Zhu	

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry.

2. This report contains findings based on the assessment by the ERT of the 2016 annual submission against the Article 8 review guidelines. The ERT has made recommendations to resolve those findings related to issues,[2] including issues related to problems.[3] Other findings and, if applicable, the ERT's encouragements to resolve them, are also included.

3. A draft version of this report was communicated to the Government of Australia, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

4. Annex I shows annual greenhouse gas (GHG) emissions for Australia, including totals excluding and including the land-use, land use change and forestry (LULUCF) sector, indirect carbon dioxide (CO_2) emissions, and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and additional activities under Article 3, paragraph 4, of the Kyoto Protocol (KP-LULUCF), if elected, by gas, sector and activity for Australia.

5. Information to be included in the compilation and accounting database can be found in annex II.

II. Summary and general assessment of the 2016 annual submission

6. Table 2 provides the ERT assessment of the annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5 below.

Table 2
Summary of review results and general assessment of the inventory of Australia

Assessment		*Issue or problem ID #(s) in tables 3 and/or 5[a]*
Dates of submission	Original submission: 7 May 2016 (NIR), 27 May 2016, version 1 (CRF tables), 19 May 2016 (SEF tables) Revised submissions: 27 May and 9 August 2016 (NIR), 9 August 2016, version 2, and 24 October 2016, version 3 (CRF tables) The values from the latest submission are used in this report	

[2] "Issues" are defined in decision 13/CP.20, annex, paragraph 81.

[3] "Problems" are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

Assessment				*Issue or problem ID #(s) in tables 3 and/or 5[a]*
Review format	Centralized			
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	Have any issues been identified in the following areas:			
	1.	Identification of key categories	No	
	2.	Selection and use of methodologies and assumptions	Yes	I.4, L.17, L.20, L.22
	3.	Development and selection of emission factors	Yes	E.7, I.28
	4.	Collection and selection of activity data	Yes	KL.7
	5.	Reporting of recalculations	Yes	G.8
	6.	Reporting of a consistent time series	Yes	I.11, L.7, L.8
	7.	Reporting of uncertainties, including methodologies	Yes	W.1
	8.	QA/QC	QA/QC procedures were assessed in the context of the national system (see below)	
	9.	Missing categories/completeness[b]	Yes	L.9
	10.	Application of corrections to the inventory	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?		Yes	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?		Yes	
Supplementary information under the Kyoto Protocol	Have any issues been identified in the following areas:			
	1.	National system:		
		(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and legal arrangements	No	
		(b) Performance of the national system functions	No	
	2.	National registry:		
		(a) Overall functioning of the national registry	No	
		(b) Performance of the functions of the national registry and the technical standards for data exchange	No	

Assessment			*Issue or problem ID #(s) in tables 3 and/or 5[a]*
	3. ERUs, CERs, AAUs and RMUs and on information on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the SIAR	Yes	G.9
	4. Matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission	Yes	G.6
	5. LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol:		
	(a) Reporting in accordance with the requirements of decision 2/CMP.8, annex II, paragraphs 1–5	No	
	(b) The Party has demonstrated methodological consistency between the reference level and reporting on forest management in accordance with decision 2/CMP.7, annex, paragraph 14	No	
	(c) The Party has reported information in accordance with decision 6/CMP.9	No	
	(d) Country-specific information has been reported to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	Yes	KL.5
	(e) Other issues	No	
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	Yes	
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	
	The ERT accepts that revised estimates submitted by Australia in its 2016 submission can replace previously applied adjustments in the compilation and accounting database	NA	
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the Parties?	Yes	
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	

Assessment			*Issue or problem ID #(s) in tables 3 and/or 5*[a]
Questions of implementation	Did the ERT list questions of implementation?	No	

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction, unit, CPR = commitment period reserve, CRF = common reporting format, ERT = expert review team, ERU = emission reduction unit, LULUCF = land use, land-use change and forestry, NA = not applicable, NIR = national inventory report, QA/QC = quality assurance/quality control, RMU = removal unit, SEF = standard electronic format, SIAR = standard independent assessment report, UNFCCC Annex I inventory reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories", Wetlands Supplement = *2013 Supplement to the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories: Wetlands*.

[a] The ERT identified additional issues in the general, energy, industrial processes and product use, agriculture, LULUCF, and waste sectors and for LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol that are not specifically listed in table 2 but are included in table 3 and/or 5.

[b] Missing categories, for which methods are provided in the *2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories*, may affect completeness and are listed in annex III to this document.

III. Status of implementation of issues and/or problems raised in the previous review report

7. Table 3 compiles all the recommendations made in the previous review report. For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2016 annual submission and provided the rationale for its determination, taking into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of Australia

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	Transparency (G.2, 2015) Transparency*	Address the remaining areas for improvement (explained in the sector-level findings listed below)	No longer relevant. The ERT noted that the Party has addressed several previous recommendations regarding transparency (G.5, E.1, E.3, E.4, I.1, I.5, I.9, I.10, I.13, I.14, I.16, I.19, I.21, I.23, I.24, I.25, I.26, I.29, A.1, A.2, L.1, L.5, L.10, L.11, L.13, L.19, L.21, L.25, W.3 and W.5). Even though some of the recommendations have not been fully addressed in the current submission (I.2, I.7, I.8, I.15, I.22 and L.24), the ERT considers that this general recommendation is no

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			longer relevant. Any outstanding recommendations are included under the corresponding category in table 3
G.2	Time-series consistency (G.3, 2015) Consistency*	Improve the general consistency of the time series by implementing the recommendations on consistency provided in the sector-level findings listed below	No longer relevant. The ERT noted that the Party has addressed several recommendations regarding consistency (E.6, E.9, I.12 and L.12). Even though some of the recommendations have not been fully addressed (I.11, L.7 and L.8), the ERT considers that this general recommendation is no longer relevant. Any outstanding recommendations are included under the corresponding category in table 3
G.3	QA/QC and verification (G.4, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Fully implement the QA/QC plans to minimize errors in the reporting and transparently describe in the NIR the QA/QC procedures applied to data received from the National Greenhouse and Energy Reporting Scheme (NGER), including the results of any checks	Resolved. No QA/QC issues were identified. The Party has put in place updated procedures for data received from NGER, including an auditing system to verify NGER data reported by facilities (NIR, volume 1, section 1.2.3). For the energy, IPPU and waste sectors, the results of the verification tests are presented in the document entitled “National inventory system: evaluation of outcomes 2015-16”, provided by the Party during the review. Additional information on the QA/QC plan is included in annex 6 to the NIR (volume 3)
G.4	Uncertainty analysis (G.6, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Update the uncertainty assessment	Resolved. As explained in the NIR (volume 3, table A6.6(c)), in the 2016 annual submission, the uncertainty estimates were improved by including 2014 category-specific NGER uncertainty estimates for electricity

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			generation, cement production and coal mining. The Party plans to expand the use of NGER uncertainty estimates to other IPPU and stationary-energy categories in the 2017 annual submission
G.5	Key category analysis (G.9, 2015) Transparency*	Increase the transparency of the reporting of the key category analysis in the NIR	Resolved. Australia's key category analysis is in line with table 4.1 of the 2006 IPCC Guidelines, volume 1, and was included in annex 1 to the NIR (volume 3). The Party has also explained in annex 1 to the NIR how the use of a more disaggregated approach for the key category analysis has led to differences in the key category analysis presented in the NIR in comparison with the key category analysis automatically performed by the CRF Reporter software
Energy			
E.1	Fuel combustion-reference approach – CO_2 (E.2, 2015) (20, 2014) (30, 2013) Transparency*	Prepare and revise the reference approach tables for the years prior to 2012 and present them in the NIR with explanations	Resolved. The Party explained in NIR, volume 3, annex 4, that the reference approach was recalculated for the years 1990–2013. Australia presented information on the comparison between the reference approach and the sectoral approach in the NIR, volume 3, annex 4, table A.4.1, for the years 1990–2014. The ERT also considers that as reference approach is reported in CRF table 1.A(b), it is not necessary to present these tables in the NIR
E.2	Fuel combustion-reference approach – all fuels – CO_2 (E.15, 2015) Comparability*	Correct the submission and thoroughly implement the QA/QC procedures to ensure the internal consistency of the entire annual submission and to ensure that such errors are identified prior to submitting the submission (a unit error was	Resolved, see E.1 above. Furthermore, the unit error identified in the previous review report no longer occurs in the 2016 annual

ID#	*Issue and/or problem classification[a, b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
		identified in CRF table 1.A(b))	submission
E.3	Multilateral operations – all fuels – CO_2, CH_4 and N_2O (E.19, 2015) Transparency*	Change the notation key to "NO" when reporting emissions from multilateral operations and make use of the documentation box, CRF table 9 and relevant sections of the NIR to explain the fuel aggregation	Resolved. The Party used the notation key "NO" in the CRF tables to report multilateral operations and reported in the documentation box of CRF table 1.D that no multilateral operations occur in Australia. The ERT noted that the Party did not include this explanation in the NIR but considered the explanation in the CRF tables is sufficient
E.4	1.A.2.a Iron and steel – solid fuels – CO_2 (E.20, 2015) Transparency*	Report in the NIR the information on the AD for black coal and coke oven gas for both the category iron and steel (1.A.2.a) and the category manufacture of solid fuels and other energy industries (1.A.1.c)	Resolved. Australia provided details of the percentage of black coal and coke oven gas fuel mix in tables 3.7 (for manufacture of solid fuels and other energy industries) and 3.13 (for iron and steel) of the NIR (volume 1)
E.5	1.B.2.a Oil – liquid fuels – CO_2 and CH_4 (E.14, 2015) (33, 2014) Accuracy*	Update the AD for petroleum storage so that they accurately reflect the actual AD that were applied to estimate emissions of petroleum storage since 2009	Resolved. The Party reported in its 2016 annual submission (CRF table 1.B.2) the AD as crude oil refined and stored
E.6	1.B.2.b Natural gas – gaseous fuels – CO_2 and CH_4 (E.12, 2015) (31, 2014) Consistency*	Improve the transparency of the discussion on the reasons underlying the following observed trends: large inter-annual changes in CH_4 emissions from natural gas production and processing; and the decline in CH_4 emissions from distribution, while CO_2 emissions increased. Provide supporting data in the relevant chapter of the NIR	Resolved. Australia made recalculations in the subcategories natural gas production and processing, to improve the time-series consistency of the data. The explanations are provided in the NIR (volume 1, section 3.9.5). The recommendation on natural gas distribution was resolved in the 2015 submission, as noted by the 2015 review report
E.7	1.B.2.b Natural gas – natural gas – CO_2 and CH_4 (E.17, 2015) Accuracy*	Collect data on emissions from any new plant types, and update the country-specific CO_2 and CH_4 EFs, where appropriate (the previous ERT noted that a new liquefied natural gas plant had started operation)	Addressing. The Party reported in the NIR (volume 3, table 6.6(a), page 172) that it plans to analyse the plant-specific data for the new liquefied natural gas plant when they become available, with a view to incorporating

ID#	*Issue and/or problem classification[a, b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
			the results of the analysis in the country-specific EFs for this category
E.8	1.B.2.b Natural gas – liquid and solid fuels – CO_2 and CH_4 (E.18, 2015) Accuracy*	Make efforts to improve the data for the emissions from this category, including the development of updated EFs that represent production activities in unconventional gas production	Addressing. The Party explained during the review that the first phase of taking measurements from non-conventional production facilities has been completed and a second phase is under way. The Party considers that this work may lead to the development of more representative EFs in future submissions
E.9	1.B.2.c Venting and flaring – liquid and gaseous fuels – CO_2 and CH_4 (E.13, 2015) (32, 2014) Consistency*	Identify appropriate methods to ensure a consistent time series when separating emissions from oil and gas flaring for the period 1990–2008 (and therefore completing the split for the complete time series) and present this information in the NIR	Resolved. The Party explained in the NIR (section 3.9.5) the implementation of a method to split, for the entire time series, emissions from oil and gas flaring
IPPU			
I.1	2. General (IPPU) – all gases (I.5, 2015) Transparency*	Improve the transparency of the reporting of the instruments supporting the performance of NGER and on the verification and validation procedures of data entries into NGER	Resolved. Transparent information is provided in the NIR (volume 1, section 1.2). See also G.3
I.2	2. General (IPPU) – HFCs and SF_6 (I.25, 2015) Transparency*	When provisional data for AD are used or reported in the NIR (e.g. identical data to those reported for the previous year as was identified by the previous ERT for the year 2013), provide transparent information that the Party is doing so and the rationale for doing so (e.g. for 2.F.1 refrigeration and air conditioning and 2.G.1 electrical equipment)	Addressing. The AD for the consumption of halocarbons and SF_6 (2.F) have been corrected for 2013 as described in the NIR (section 4.8.5). The national stock of electrical equipment (2.G.1) presented in table 4.40 of the NIR included different values for 2012, 2013 and 2014 indicating that provisional data were not used. However, in table 4.27 of the NIR, the domestic refrigeration stock is constant for 2012–2014. Below the table, the Party included footnote c indicating that the value is a "projection" and footnote d stating that "data unavailability at time of

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			publication required stocks to be held constant. To be updated for following submissions". However, it is not clear to which data in table 4.27 these footnotes refer
I.3	2.A.1 Cement production – CO_2 (I.6, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correct the identified inconsistency in the methodology and AD reported in the CRF tables and the NIR and enhance the QA/QC procedures to avoid the occurrence of such errors	Resolved. No inconsistencies were identified between the reported methodology and the AD in the NIR and CRF tables
I.4	2.A.1 Cement production – CO_2 (I.7, 2015) Accuracy*	Confirm or update the CaO and MgO content ratios in order to ensure the accuracy of the values for more recent years and the consistency of the time series	Addressing. The Party informed the ERT that it is investigating the availability and/or derivation of content ratios, and that this would be incorporated into future submissions
I.5	2.A.2 Lime production – CO_2 (I.8, 2015) Transparency*	Clarify, in the NIR, that the NGER data used in the inventory estimates include the amount of lime produced in-house	Resolved. The Party has provided the appropriate information in its NIR (volume 1, page 176)
I.6	2.A.4 Other process uses of carbonates – CO_2 (I.9, 2015) Transparency*	Provide transparent explanations of recalculations in the NIR, particularly for specific years when they are significantly different from other years in the time series	No longer relevant. The Party did not carry out recalculations for this category
I.7	2.B.1 Ammonia production – CO_2 (I.10, 2015) Transparency*	Improve the level of transparency used to report disaggregated subcategory emission data for ammonia production, while preserving the legally required confidentiality in the overall reporting of emissions	Addressing. No disaggregated information on emissions related to ammonia production has been provided in the NIR (volume 1, section 4.4.1). In CRF table 2(I).A-H, the notation key "C" has been used to report the AD and the notation key "IE" has been used to report the emissions. Nevertheless, the emissions have been represented in a disaggregated manner in the key category analysis in the NIR (volume 3, page 109)

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
I.8	2.B.1 Ammonia production – CO_2 (I.10, 2015) Transparency*	Ensure consistency between the emission levels reported in the IPPU chapter of the NIR and in the key category analysis	Not resolved. See I.7
I.9	2.B.1 Ammonia production – CO_2 (I.11, 2015) Transparency*	Improve the transparency of the reporting of the EF range used in the country and its origin, namely by stating that it is based on data from an individual plant across several years	Resolved. Australia has provided the information in its NIR (volume 1, page 185)
I.10	2.B.7 Soda ash production – CO_2 (I.13, 2015) Transparency*	Report more transparently on the methodology applied and on the allocation of carbon-containing by-products (e.g. in the food and beverage industry) and the corresponding emissions for the years up to 2013	Resolved. Australia has provided sufficiently transparent information on the method, including the use of sodium bicarbonate reported under category 2.H.2 (food and beverages industry) in its NIR. As explained on page 189 of the NIR, emissions are not reported separately due to confidentiality reasons
I.11	2.C Metal industry – CO_2 (I.34, 2015) Consistency*	Investigate whether other drivers could be applied to estimate emissions from lead production, zinc production and other (metal production) for the period 1990–2008, such as production volumes	Not resolved. The same approach was used in the 2015 and 2016 annual submissions. During the review, Australia stated that it plans to investigate other applicable indicators such as production volumes for lead and zinc production and other (metal production)
I.12	2.C.1 Iron and steel production – CO_2 (I.15, 2015) Consistency*	Verify whether the EF for 2011 has been used to determine the energy balance in recent years, make efforts to update the EFs for the most recent years and improve the consistency of the time series	Resolved. Australia explained in the NIR (volume 1, page 44) that the CO_2 EF for coke is derived from a carbon balance conducted for coke ovens and that it varies from year to year. The time series of the CO_2 EF is presented in table 3.A.22 of the NIR, volume 1, for the years 1990–2014
I.13	2.C.1 Iron and steel production – CO_2 (I.15, 2015) Transparency*	Correct the reporting of the EFs for coke used in the iron and steel industry as reported in the NIR for the energy sector (table 3.2)	Resolved. NIR table 3.2 shows the CO_2 EF for 2014, which is the same as that used in table 3.A.22

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
I.14	2.C.1 Iron and steel production – CO_2 (I.16, 2015) Transparency*	Improve the transparency and consistency of the reporting between the CRF tables and the NIR by including the AD for natural gas and for pulverized coal used as reducing agents in CRF table 2(I).A-H	Resolved. The emission data for pulverized coal use are reported in CRF table 2(I).A-Hs2 and appropriate AD for natural gas are reported in the NIR, volume 1 (table 4.16, page 199). Emissions from hot briquetted iron production, which used natural gas during the period 2000–2004, are reported in CRF table 2(I).A-Hs2 under "direct reduced iron"
I.15	2.C.1 Iron and steel production – CH_4 (I.17, 2015) Transparency*	Correct the AD for steel production in the CRF tables and improve the QA/QC tests for the reporting in the NIR and the CRF tables in order to avoid data entry errors	Not resolved. The data for steel production reported in the NIR (page 199) (5 186 kt in 2014) are not consistent with the data reported in CRF table 2(I).A-H (4 446.23 kt crude steel in 2014)
I.16	2.C.1 Iron and steel production – CH_4 and N_2O (I.18, 2015) Transparency*	Perform a more thorough analysis of recalculations and report more transparently on recalculations and underlying changes	Resolved. NIR, volume 1, section 4.5.8 provides information on recalculations carried out for iron and steel production due to revisions of the derivation of coal consumption based on production data for crude steel
I.17	2.D Non-energy products from fuels and solvents use – CO_2 (I.19, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Make efforts to avoid reporting recalculation changes that are only due to rounding	Resolved. Reporting on such recalculation changes has not been observed in the 2016 annual submission
I.18	2.E Electronics industry – NF_3 (I.20, 2015). Adherence to the UNFCCC Annex I inventory reporting guidelines	Use the correct notation key ("NE") and provide in the NIR the reasons why such emissions or removals have not been estimated in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines	Resolved. Australia provided information in chapter 4.7 of the NIR, volume 1, and reported the emissions using the notation key "NE" in CRF table 2(II)
I.19	2.F. Product uses as	Improve the transparency and complement the	Resolved. Table 4.24 of the

ID#	*Issue and/or problem classification[a, b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
	substitutes for ozone-depleting substances – HFCs (I.21, 2015) Transparency*	table containing the key assumptions per subcategory (table 4.24) with an indication of which method has been applied to estimate the emissions from each subcategory	NIR, volume 1, has been amended to indicate the method used
I.20	2.F. Product uses as substitutes for ozone-depleting substances – HFCs (I.22, 2015) Adherence to UNFCCC Annex I inventory reporting guidelines	Improve the consistency of the reporting in the NIR by ensuring that consistent values are presented in both the tables and the text (the previous ERT identified differences in the values of bulk and pre-filled imports)	No longer relevant. The values for bulk and pre-filled imports allocated to the different subcategories are reported only in table 4.25 of the NIR, volume 1
I.21	2.F. Product uses as substitutes for ozone-depleting substances – HFCs (I.23, 2015) Transparency*	Correct the AD for the amounts remaining in products at decommissioning	Resolved. The correct AD have been reported in CRF table 2(II)B-Hs2
I.22	2.F. Product uses as substitutes for ozone-depleting substances – HFCs (I.23, 2015) Transparency*	Include in the methodological description in the NIR a more accurate description of the methodology used, in particular the use of the vintage stock model	Addressing. Australia has included additional text on IEFs in the NIR; however, a more detailed explanation of the vintage stock model use is required to ensure transparency
I.23	2.F.1 Refrigeration and air conditioning – HFCs (I.24, 2015) Transparency*	Enhance the transparency of the reporting of disposal emission percentages and recovery percentages of HFC emissions in the NIR	Resolved. An explanation has been included in chapter 4.8 of the NIR
I.24	2.F.1 Refrigeration and air conditioning – HFCs (I.26, 2015) Transparency*	Improve the consistency of the reporting by ensuring that the values presented in the tables in the NIR are consistent with the data in the CRF tables and with data from the underlying vintage stock model	Resolved. No inconsistencies between the NIR and the CRF tables were identified
I.25	2.F.1 Refrigeration and air conditioning – HFCs (I.27, 2015) Transparency*	Include in the NIR information about the analysis undertaken which showed that the charge in pre-filled units did not differ much over the years, indicating that despite car size, an increase in air-conditioning equipment charge is offset by more efficient equipment, justifying the assumptions made	Resolved. An explanation has been reported in section 4.8 of the NIR
I.26	2.F.2 Foam blowing agents –	Report more transparently on the method and assumptions applied for estimating emissions from	Resolved. An explanation has been reported in chapter 4.8

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	HFCs (I.28, 2015) Transparency*	foam blowing	of the NIR
I.27	2.F.4 Aerosols – HFCs (I.29, 2015) Comparability*	Find ways to improve the reporting of the AD and emissions for this category, or improve the transparency of the reporting by including the explanation of the apparent operational loss factor being higher than 100%	Resolved. The Party explained during the review that the combination of operational and production losses in the 2015 submission was due to a bug in the CRF Reporter software. The ERT noted that such an error did not occur in the 2016 annual submission
I.28	2.F.5 Solvents – HFCs (I.30, 2015) Accuracy*	Align the calculation method with the definition provided in the NIR, and apply an operational loss of 25%, 50% and 25%, respectively, for use of F-gases as solvents	Not resolved. Australia confirmed that it is planning to update its calculation model to use the proposed values for operational losses (NIR, volume 1, section 4.8.6)
I.29	2.F.5 Solvents – HFCs (I.31, 2015) Transparency*	Include the methodology description for this category in the NIR	Resolved. Australia included additional text and added emissions from aerosols/solvents to table 4.39 of the NIR, volume 1 (chapter 4.8)
I.30	2.G.1 Electrical equipment – SF_6 (I.2, 2015) (39, 2014) (65, 2013) (55, 2012) Comparability*	Disaggregate and report separately emissions from the operation of electrical equipment and emissions from the disposal of electrical equipment	Resolved. Australia reported emissions separately in CRF table 2(II)B-Hs2
I.31	2.G.3 N_2O from product uses – N_2O (I.35, 2015) Accuracy*	Investigate if indeed no imports occur and report these emissions, if appropriate	Resolved. The emission estimates provided are based on N_2O consumption (see I.34)
Agriculture			
A.1	3. General (agriculture) – (A.6, 2015) Transparency*	When multiple changes are applied in a single category, provide information on at least the qualitative impact of each individual change in the overall result of the recalculation	Resolved. The impacts of individual changes on overall recalculations are reported qualitatively and quantitatively in the NIR (volume 1, sections 5.3.8, 5.4.11, 5.6.13, 5.7.1, 5.8.3 and

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			5.9.5)
A.2	3.B Manure management – CH_4 and N_2O (A.9, 2015) Transparency*	Include additional information on the approaches used to estimate volatile solids and nitrogen inputs and losses for each animal waste management system and the associated CH_4, N_2O and NH_3 emissions for feedlot cattle, pigs and poultry (e.g. using a flow chart) in the NIR	Resolved. A flow chart for the mass flow method of estimating manure management emissions has been provided in the NIR (volume 1, figure 5.3)
LULUCF			
L.1	4. General (LULUCF) – CO_2, CH_4 and N_2O (L.3, 2015) (52, 2014) Transparency	Provide detailed explanations of any recalculations in the NIR	Resolved. Australia presented tables in the NIR (volume 2) with detailed information on the impact of all recalculations, including for forest land remaining forest land (table 6.28)
L.2	4. General (LULUCF) (L.7, 2015) (55, 2014) Adherence to UNFCCC Annex I inventory reporting guidelines	Enhance the QA/QC measures and ensure full correspondence between the data reported in the NIR and the CRF tables regarding distribution on total land area per land-use category/subcategory	Resolved. The distribution of total land area per land-use category was consistently reported in NIR, volume 2, table 6.5 and CRF table 4.1 in the Party's submission of 9 August 2016
L.3	4. General (LULUCF) – CO_2 (L.24, 2015) Completeness	Estimate emissions/removals for categories/subcategories and pools for which guidance is provided in the 2006 IPCC Guidelines, specifically for cropland and grassland converted to settlements, or provide justifications in the next NIR for the exclusions made in terms of the likely level of emissions in accordance with the UNFCCC Annex I inventory reporting guidelines, paragraph 37(b)	Resolved. In its original submission and submission of 24 October 2016, Australia reported emissions/removals from cropland and grassland converted to settlements as "IE" (previously reported as "NE" in the 2015 submission). See also L.29
L.4	4. General (LULUCF) – CO_2 (L.25, 2015) Comparability	Provide separate AD and estimates for the categories currently reported as "IE" for which suitable data and estimation methodologies are available, in particular for forest conversions to other land uses than cropland (included under forest land converted to grassland) and for grassland converted to cropland	Resolved. In its submission of 24 October 2016, Australia reported for the first time emission and removal estimates for forest land converted to flooded land (see L.14) and forest land converted to settlements (see L.15). Australia continues to report, in CRF table 4.B, grassland converted to cropland as "IE". During the review, the Party provided a justification for its reporting (see L.28)

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
L.5	4.A.1 Forest land remaining forest land (L.9, 2015) (57, 2014) Transparency	Include in the NIR additional information regarding the mapping of plantations established/recorded from 1940 to 1989, and the associated estimates	Resolved. In table 6.19 of the NIR (volume 2), Australia reported the areas of land converted to plantation from 1940 to 1989. Australia has also included a broad description of the methods employed, including the use of the national plantation inventory
L.6	4.A.1 Forest land remaining forest land – CO_2 (L.27, 2015) Accuracy	Implement the suggested improvements in accuracy, regarding the assumption for the time period for subsequent regrowth after a fire event	Resolved. Following the recommendation of the previous ERT, the five-year linear recovery of biomass after wildfires (two years following prescribed fires) used in previous submissions has been modified to use Olson curves calibrated to empirical data for each state and territory and for each fire type (NIR, volume 2, page 49)
L.7	4.A.2 Land converted to forest land – CO_2, CH_4 and N_2O (L.28, 2015) Consistency	Implement the planned improvement to allocate the AD and emissions/removals from forest conversion events that occurred before 1990 and that are followed by natural regeneration in a consistent manner and in accordance with the 2006 IPCC Guidelines	Not resolved. In the NIR (volume 3, page 194), the Party stated that improvement of the allocation of lands in these complex circumstances is included in the inventory improvement plan
L.8	4.A.2 Land converted to forest land – CO_2, CH_4 and N_2O (L.28, 2015) Consistency	In the specific case of subsequent land-use changes within a period shorter than 50 years, base the rule for the allocation of AD and estimates in each reporting year on the end-use category of the land in that year	Not resolved. In the NIR (volume 3, page 194), the Party stated that improvement of the allocation of lands in these complex circumstances is included in the inventory improvement plan
L.9	4.A.2 Land converted to forest land – CO_2, CH_4 and N_2O (L.29, 2015) Completeness	Report emissions/removals occurring throughout the reporting period owing to natural forest regeneration before 1990	Not resolved. According to the NIR (volume 2, section 6.5.5), Australia is planning to continue refinements to the FullCAM modelling parameters for forest/plantation growth and regeneration (including for the pre-1990 period), informed by empirical

ID#	*Issue and/or problem classification[a, b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
			research
L.10	4.B.1 Cropland remaining cropland – CO_2 (L.30, 2015) Transparency	Include in the NIR charts showing the impact of the main drivers of the trends in the estimates	Resolved. In the 2016 annual submission, Australia included additional information on historical trends of cropping systems (NIR, volume 2, appendix 6.E, including charts 6.E.5, 6.E.6 and 6.E.7)
L.11	4.B.1 Cropland remaining cropland – CO_2 (L.31, 2015) Transparency	Report the carbon stock changes and emissions/removals using an appropriate subdivision (e.g. land management practices) in the CRF tables or in the NIR	Resolved. In table 6.2 of the NIR (volume 2), Australia has reported information on net emissions and removals from perennial woody crops (biomass) for cropland remaining cropland for the period 1990–2014
L.12	4.C.1 Grassland remaining grassland – CO_2 (L.32, 2015) Consistency	Use the guidance provided in the 2006 IPCC Guidelines to ensure the consistency of the time series regarding the treatment of fire history prior to 1988 and owing to the use of different data sources relating to pasture/grass species between the periods 1990–1999 and 2000–2013	Resolved. In section 6.8.5 of the NIR (volume 2) entitled "Recalculations since the 2013 inventory" (related to grassland remaining grassland), Australia refers to the implementation of this improvement, but does not provide further explanation (see also L.26). The ERT notes that Australia has quantified the effect of this recalculation under "grassland fires – CO_2" in table 6.48 of the NIR (volume 2)
L.13	4.C.1 Grassland remaining grassland – CO2 (L.33, 2015) Transparency	Report the carbon stock changes and emissions/removals using an appropriate subdivision (e.g. land management practices) in the CRF tables or in the NIR in order to improve transparency	Resolved. In table 6.3 of the NIR (volume 2), the Party has reported information on net emissions and removals from grassland remaining grassland, subdivided into herbaceous grassland, as well as transitions and fires related to perennial woody biomass in the period 1990–2014
L.14	4.D.2 Land converted to wetlands – CO_2 (L.19, 2015) (66, 2014)	Identify in the annual submission the conversions from forest land to wetlands, and provide separate AD and emission estimates (for cases where the emissions are associated with those from the conversion from forest land to grassland)	Resolved. During the review, Australia provided separate AD and emission and removal estimates for forest land converted to grassland, and

ID#	*Issue and/or problem classification[a, b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Comparability		forest land converted to wetlands. These revised estimates were included in the revised CRF tables submitted on 24 October 2016
L.15	4.E.2 Land converted to settlements – CO_2 (L.20, 2015) (67, 2014) Comparability	Distinguish the conversions from forest land to settlements, and provide separate AD and emission estimates (for cases where the emissions are associated with those from the conversion from forest land to grassland)	Resolved. During the review, Australia provided separate AD and emission and removal estimates for forest land converted to grassland (29 134.61 kt CO_2 in 2014) and forest land converted to settlements (262.15 kt CO_2 in 2014). These revised estimates were included in the revised CRF tables submitted on 24 October 2016
L.16	4(V) Biomass burning – CO_2 (L.35, 2015) Comparability	Find ways to report CO_2 immediate emissions resulting from fires in CRF table 4(V) and report subsequent carbon stock changes on these areas as carbon stock changes in CRF tables 4.A–4.E, where appropriate	Addressing. The ERT noted that CO_2 emissions are reported in CRF table 4(V) for the following categories: forest land remaining forest land; land converted to forest land; grassland remaining grassland; and land converted to grassland. For the last two categories, Australia reported negative values (removals). This has not been transparently explained in the documentation box, following the requirements in CRF table 4(V), footnote 5 For other categories such as cropland remaining cropland (wildfires), land converted to cropland, wetlands remaining wetlands and land converted to wetlands (wildfires), Australia reported CO_2 emissions as "IE"
L.17	4(V) Biomass burning – CO_2, CH_4 and N_2O (L.36, 2015) Accuracy	Make further efforts to find more effective ways to differentiate the impact of non-anthropogenic emissions/removals on the forest carbon dynamics in accordance with the 2006 IPCC Guidelines	Addressing. Compared to the 2015 submission, Australia has implemented a revised method to differentiate the impact of non-anthropogenic emissions/removals. The method is explained

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			transparently in the NIR: Australia identifies and separates natural disturbances from anthropogenic emissions/removals from biomass burning in temperate forests in its reporting under the Convention, citing concepts developed in the Kyoto Protocol Supplement (see, e.g., NIR, volume 2, page 4). The ERT notes that the natural disturbances were identified in temperate forests only and considers that Australia should make further efforts to find ways to differentiate the impact of non-anthropogenic emissions/removals on the forest carbon dynamics in accordance with the 2006 IPCC Guidelines for all forests
L.18	4(V) Biomass burning – CO_2, CH_4 and N_2O (L.36, 2015) Accuracy	Clearly demonstrate that the approach to differentiate the impact of non-anthropogenic emissions/removals is unbiased, scientifically sound and transparent; the definitions and assumptions are applied consistently; and any subsequent removals are also excluded and emissions from salvage logging are included in the final estimates	Resolved. For biomass burning in native forests, NIR, volume 2, section 6.4.6.3 includes a justification on why the use of the method to differentiate the impact of non-anthropogenic emissions/removals is unbiased and explains that the approach has been subject to an independent review. The Party also explains that this separation results in both CO_2 emissions and removals from natural disturbances being excluded from the inventory while all fire areas are monitored for any permanent change in land use or salvage logging (which, if identified, would trigger reporting of emissions)
L.19	4(V) Biomass burning – CO_2, CH_4 and N_2O	Include a more detailed rationale and tables (e.g. an elaborated version of table 6.25 in the NIR) clarifying the application of this provision and its	Resolved. The rationale followed by Australia for applying this provision has

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	(L.36, 2015) Transparency	impact on the final forest estimates throughout the reporting period	been included in the NIR (volume 2, pages 36–38). Table 6.27 of the NIR provides information on the impacts of isolating the natural disturbance emissions and averaging of the final emissions and removals in 1990–2014
L.20	4(V) Biomass burning – CO_2, CH_4 and N_2O (L.37, 2015) Accuracy	Either report the actual emissions/removals from wildfires in forest land in the year in which they occur, or find ways to demonstrate in the NIR that the averaging procedure applied does not represent a correction of estimates and how the quality (i.e. accuracy), transparency and comparability of the estimates of forest fires could be improved and the uncertainty reduced by the application of this procedure. In the latter case, the ERT further recommends that Australia include in the NIR the entire time series of both raw (not averaged) and final estimates to ensure transparency and comparability	Addressing. Australia recalculated the emissions from wildfires in forest land. In the 2015 submission, the Party used five-year averaging of final net emission estimates, whereas in the 2016 annual submission, the Party smoothed the activity data for area burned according to a five-year moving average. The Party also explained that this procedure does not represent a correction to its estimates, because it does not affect the long-term trend. Furthermore, Australia improved transparency by presenting raw and averaged estimates in the NIR (volume 2, figure 6.17, p.47). However, the ERT considers that the Party should improve transparency by elaborating how multi-year averaging may be used to improve the accuracy and comparability of the annual estimates of biomass stocks, while avoiding increased uncertainty by the application of this procedure. The Party explained during the review that the 2006 IPCC Guidelines (volume 1, chapter 2, page 2.11) refer to use of multi-year averaging in the context of high inter-annual variability, which is the case for biomass stocks in areas

ID#	*Issue and/or problem classification[a, b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
			prone to wildfires in Australia
L.21	4(V) Biomass burning – CH_4 and N_2O (L.21, 2015) (68, 2014) Transparency	Report in the CRF tables the AD for biomass burning on grassland remaining grassland	Resolved. The AD for biomass burning on grassland remaining grassland were reported in CRF table 4(V) for the entire time series
L.22	4(V) Biomass burning – CH_4 and N_2O (L.38, 2015) Accuracy	Either report actual emissions/removals from fires in grassland remaining grassland in the year in which they occur, or find ways to demonstrate in the NIR that the averaging procedure applied does not represent a correction of estimates and how the quality (i.e. accuracy), transparency and comparability of the fire estimates on grassland can be improved and the uncertainty reduced by the application of this procedure. In the latter case, the ERT further recommends that Australia include in the NIR the entire time series of both raw (not averaged) and final estimates to ensure transparency and comparability	Addressing. Australia recalculated the emissions from wildfires in grassland remaining grassland. In the 2015 submission, the Party used five-year averaging of final net emission estimates, whereas in the 2016 annual submission, the Party smoothed the activity data for area burned according to a five-year moving average. The Party also explained that this procedure does not represent a correction to its estimates, because it does not affect the long-term trend. Furthermore, Australia improved transparency by presenting raw and averaged estimates in the NIR (volume 2, table 6.47). However, the ERT considers that the Party should improve transparency by elaborating how multi-year averaging may be used to improve accuracy and comparability of the annual estimates of biomass stocks, while avoiding increased uncertainty by the application of this procedure. The Party explained during the review that the 2006 IPCC Guidelines (volume 1, chapter 2, page 2.11) refer to the use of multi-year averaging in the context of high inter-annual variability, which is the case for biomass stocks in areas prone to wildfires in Australia

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
L.23	4.G Harvested wood products – CO_2 (L.39, 2015) Comparability	Report separately the carbon gains and losses in CRF table 4.G	Resolved. In CRF table 4.Gs1 the Party has reported both gains and losses for the entire time series
L.24	4.G Harvested wood products – CO_2 (L.40, 2015) Transparency	Improve the transparency of the reporting of harvested wood products by explicitly reporting these carbon losses (related to fuelwood consumption) in CRF table 4.G (e.g. by using an appropriate subdivision under other (4.G.3)) or alternatively in the NIR	Addressing. Australia reported in the NIR the fuelwood consumed (in kt C) for selected years of the time series (1990, 2000, 2005–2014) (volume 2, table 6.52). The information was not presented for the year 1995, in line with the UNFCCC Annex I inventory reporting guidelines
L.25	4.G Harvested wood products – CO_2 (L.42, 2015) Transparency	Improve the transparency of the reporting by reporting separately carbon losses due to transfer of carbon stock between forests and harvested wood products in CRF table 4.A (e.g. by using an appropriate subdivision) and by more clearly explaining in the NIR the reporting artefact used to avoid double counting between CRF tables 4.A and 4.G	Resolved. The Party did not use subdivisions in CRF table 4.A but the ERT considered this is not a mandatory requirement. Table 6.54 of the NIR (volume 2) presents information on the carbon stocks of harvested wood products, for selected years of the time series (1990, 2000, 2005, 2009–2014). The Party explained in the NIR, volume 2, pages 19, 24 and 94, how double counting was avoided
Waste			
W.1	5. General (waste) – CO_2, CH_4 and N_2O (W.4, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Implement a new uncertainty analysis in line with the 2006 IPCC Guidelines and update the information and data on the uncertainty analysis	Addressing. Australia reported in the NIR (section 7.10.5, volume 2) that it plans to update the waste sector uncertainty analysis taking into consideration recent improvements in the methods and emission factors. The Party is planning to report the results in the next annual submission
W.2	5.C.1 Waste incineration – CH_4 (W.7, 2015) Completeness*	Report CH_4 emissions from the incineration of MSW for each year of the period 1990–1996	Resolved. Australia reported CH_4 emissions from the incineration of MSW for each year of the period 1990–1996 in CRF table 5.C

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
W.3	5.C.1 Waste incineration – CH_4 and N_2O (W.1, 2015) (77, 2014). Transparency*	If no new information is reported for clinical waste or solvents, replace the notation key "NA" with "NE"	Resolved. See W.4
W.4	5.C.1 Waste incineration – CH_4 and N_2O (W.8, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Report CH_4 and N_2O emissions from incineration of clinical wastes and solvents as "NE" and provide in the NIR of the next inventory submission the reasons why such emissions or removals have not been estimated in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines, or report emissions from these categories when data are available	Resolved. Australia reported CH_4 and N_2O emissions from incineration of clinical wastes and solvents as "NE" and explained in the NIR (volume 2, section 7.5) that the emissions were estimated to contribute around 0.0001% of national total emissions. See also W.7 below
W.5	5.D Wastewater treatment and discharge – N_2O (W.9 2015) Transparency*	Correct the statement in the NIR (volume 2, page 182) that reads: "Emissions of N_2O from land application are not included in the agriculture sector but are included within the wastewater sector itself"	Resolved. Australia reported in the NIR (volume 2, section 7.6.1) that emissions of N_2O from land application are included in the agriculture sector under category 3.D (agricultural soils)
KP-LULUCF[c]			
KL.1	General (KP-LULUCF) – CO_2 (84, 2014) Transparency*	Provide in the NIR the methodological assumptions and data used to estimate emissions from lime application on units of land subject to afforestation/reforestation and deforestation	No longer relevant. In accordance with the new CRF tables adopted in decision 6/CMP.9, Australia does not report liming separately for units of land subject to afforestation/reforestation and deforestation but reports all liming in the agriculture sector (CRF table 3.G-I and NIR, volume 1, section 5.9)
KL.2	General (KP-LULUCF) (80, 2014) Comparability*	Enhance QA/QC measures for a fully consistent representation of land and provide the corrected figures (zero was reported for 'other' in CRF table NIR-2)	Resolved. Australia reported non-zero area for 'other' in CRF table NIR-2 indicating that QA/QC measures were enhanced
KL.3	Deforestation – (83, 2014) (99, 2013) (115, 2012)	Closely consider the current national circumstances in the context of the new UNFCCC Annex I inventory reporting guidelines to ensure that all of the required land	Resolved. Australia provided in its annual submission and during the review information which

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
	Transparency*	areas, emissions and removals are accurately accounted for in the annual submission, including emission estimates from deforestation on each and any cleared forest land since 1990, regardless of its land use on 31 December 1989	clarified that the Party reports under deforestation all direct, human induced forest conversions after 1990, regardless of the land use on 31 December 1989, including those lands that converted naturally to forest land after 1990 from which the forest vegetation has been cleared. For example, table 11.10 of the NIR, volume 3, provides a reconciliation between forest land conversions under the Convention and deforestation under the Kyoto Protocol, and the section 11.4.4 explains that differences are only due to (1) land in a forest conversion classification that was clear of forest on 31 December 1989 that has naturally regrown and had not been re-cleared; and (2) land cleared prior to 1990 that has remained cleared. NIR, volume 3, section 11.4.1 and table 11.7 also explain that deforestation includes lands where there has been direct human-induced conversion of forest to other land uses since 1 January 1990. This information indicates that there is no precondition that land should have continuously remained forest from 1990 in order to be identified as deforestation land NIR, volume 3, section 11.2.3.1, table 11.3, also explains that areas reported as afforestation/ reforestation (which includes lands subject to natural regeneration after

ID#	*Issue and/or problem classification*[a, b]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			1990) are continuously monitored for land-use change that would constitute deforestation

Abbreviations: AD = activity data, C = confidential, CaO = calcium oxide, CRF = common reporting format, EF = emission factor, ERT = expert review team, F-gases = fluorinated gases, FullCAM = Full Carbon Accounting Model, IE = included elsewhere, IEF = implied emission factor, IPPU = industrial processes and product use, Kyoto Protocol Supplement = *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, MgO = magnesium oxide, MSW = municipal solid waste, NA = not applicable, NE = not estimated, NIR = national inventory report, NO = not occurring, QA/QC = quality assurance/quality control, UNFCCC Annex I inventory reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories", 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue was raised. Issues are further classified as defined in decision 13/CP.20, annex, paragraph 81. In the review of the supplementary information reported in accordance with Article 7, paragraph 1, of the Kyoto Protocol, the ERT has applied the classification in decision 22/CMP.1, annex, paragraph 69, in conjunction with decision 4/CMP.11.

[b] An asterisk is included next to each issue type for all issues that are also problems, as defined in decision 22/CMP.1, annex, paragraphs 68 and 69, including those that lead to an adjustment or a question of implementation.

[c] Australia's 2015 submission was reviewed under the Convention, and therefore the previous review report recommendations for KP-LULUCF are from the 2014 annual review report.

IV. Issues identified in three successive reviews and not addressed by the Party

8. In accordance with paragraph 83 of the UNFCCC review guidelines, and as documented in table 4 below, the ERT has assessed that there are no issues to be included in a prominent paragraph.

Table 4
Issues identified in three successive reviews and not addressed by Australia

ID#	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*
General		
	No such general issues were identified	
Energy		
	No such issues for the energy sector were identified	
IPPU		
	No such issues for the IPPU sector were identified	
Agriculture		
	No such issues for the agriculture sector were identified	
LULUCF		

ID#	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed*
	No such issues for the LULUCF sector were identified	
Waste		
	No such issues for the waste sector were identified	
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

Abbreviations: IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry.

V. Additional findings made during the 2016 technical review

9. Table 5 contains findings made by the ERT during the technical review of the 2016 annual submission of Australia that are additional to those identified in table 3 above.

Table 5
Additional findings made during the 2016 technical review of the annual submission of Australia

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
General			
G.6	Article 3, paragraph 14, of the Kyoto Protocol	According to decision 15/CMP.1, annex, paragraph 24, in conjunction with decision 3/CMP.11, Parties included in Annex II shall incorporate, in their annual submissions, information on how they give priority, in implementing their commitments under Article 3, paragraph 14, of the Kyoto Protocol, to the actions listed in that paragraph. In addition, according to paragraph 25 of the same decision, Parties included in Annex I shall include information in their NIRs on any changes that have occurred, compared with the information reported in their last submission, on how they are striving, under Article 3, paragraph 14, of the Kyoto Protocol, to implement their commitments mentioned in Article 3, paragraph 1 bis, of the Kyoto Protocol in such a way as to minimize adverse social, environmental and economic impacts on developing country Parties, particularly those identified in Article 4, paragraphs 8 and 9, of the Convention. During the review, the ERT asked the Party to explain how it gives priority to the actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission. Australia explained that social and environmental impacts are considered in the context of its domestic processes for assessing the impacts of implementing policy initiatives, and that the Party actively participates in international processes that contribute to addressing the actions listed in decision 15/CMP.1 The ERT recommends that Australia improve the transparency of the reporting on Article 3, paragraph 14, of the Kyoto Protocol and, in particular, provide information to confirm whether the changes reported in its submission are related to the actions listed in decision 15/CMP.1, annex, paragraph 24	Yes. Transparency*
G.7	NIR	NIR, volume 1, table 1.5, shows the current uses of NGER data in the Australian GHG inventory. During the review, the ERT asked the Party to clarify how completeness is achieved for categories where completeness is reported as “No” in table 1.5. The Party provided the ERT with clear information by category and for the whole inventory that allowed the ERT to verify the completeness of Australia’s GHG inventory The ERT encourages the Party to include in its NIR, and update where necessary, the table provided to the ERT during the review week, which summarizes how the inventory is complete for all categories, and in particular for those categories where the completeness of NGER data was reported as “No” in table 1.5 of the 2016 NIR	Not an issue

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
G.8	Recalculations	Australia reported downward recalculations of total GHG emissions including LULUCF for the year 2013 in its annual submission of 24 October 2016 (–8 016.60 kt CO_2 eq). There were also substantial upward recalculations in total GHG emissions including LULUCF for 1990 (16 003.95 kt CO_2 eq), which had an impact on the deforestation emissions included in the assigned amount. The reasons for these recalculations can be found in chapter 10 of the NIR, but there was no quantification of the impact in chapter 10, as noted also in the 2015 inventory review report (finding G.2). During the 2016 review, the Party provided the ERT with quantitative information regarding the largest recalculations, which allowed the ERT to verify that the emissions were not underestimated in the last reported year or overestimated in the base year	Yes. Transparency*
		The ERT recommends that the Party transparently report, in chapter 10 of its NIR, the reasons and associated quantitative impacts of the largest recalculations	
G.9	National registry	According to the 2016 SIAR, the national registry of Australia has not fulfilled the requirements regarding the public availability of information in accordance with decision 13/CMP.1, annex, chapter II.E. During the review, the Party provided information regarding recent developments since the publication of the SIAR. The Party explained that the discrepancy can be attributed to an oversight in the design of the public report automatic population function. The Party further informed the ERT of its plans to update the publicly available information regarding the year 2015 and to redesign the public report automatic population function to include the clean development mechanism CER units	Yes. Transparency*
		The ERT recommends that the Party update the publicly available 2015 reports to include the CER units in accordance with decision 13/CMP.1, annex, chapter II.E, in conjunction with decision 3/CMP.11, and that the Party minimize errors linked to the public report automatic population function	
G.10	Commitment period reserve	In its original NIR, Australia reported the commitment period reserve as 4 019 293 318 t CO_2 eq. In its NIR of 9 August 2016, the Party reported the commitment period reserve as 4 063 866 635 t CO_2 eq. Owing to the revised assigned amount (see document FCCC/IRR/2016/AUS, table 3, ID#1), the Party revised its commitment period reserve to 4 060 457 843 t CO_2 eq on 24 October 2016. The ERT agreed with the revised commitment period reserve, noting that application of the rounding convention for the commitment period reserve results in a value of 4 060 457 844 t CO_2 eq	Not an issue
Energy			
E.10	Comparison with international data	The ERT noted discrepancies in the time series of the Party's energy statistics and the IEA data. For example, the amount of crude oil production in 1992–2001 is systematically higher in the CRF	Not an issue

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		tables (by up to 42%) than in the IEA data. For the same period, the NGL production reported in the CRF tables is lower (by 50–70%) than in the IEA data. During the review, the Party explained that part of the crude oil production in 1992–2001 may be classified as NGL in the IEA data. The Party further noted that the lack of a time-series recalculation by the Australian Department of Industry, Innovation and Sciences of the data reported to IEA is an important factor contributing to the discrepancy	
		The ERT encourages Australia to strive to ensure as much consistency as possible between the data reported to IEA and those reported under the Convention	
IPPU			
I.32	2.A.1 Cement production – CO_2	The emissions from cement production decreased from 3 518.24 kt CO_2 in 2012 to 3 137.57 kt CO_2 in 2014. According to the NIR (section 4.3.1), there are three clinker producers in Australia. During the review, the Party explained that the production of clinker in Australia responds to market conditions. Competition with imported products has become a significant issue for domestic production, especially in recent years. In 2012, one clinker production facility ceased operation	Yes. Transparency*
		The ERT recommends that the Party provide explanatory information with regard to the fluctuation of emissions related to the clinker production trend in the NIR, including the information that domestic production has decreased due to competition with imported products, and that in 2012 a clinker production facility ceased operation	
I.33	2.A.4 Other process uses of carbonates – CO_2	Australia has calculated emissions from the use of limestone in iron and steel production, ferroalloys, magnesia, zinc, glass, ceramics and brick production under the category other process uses of carbonates (NIR, section 4.3.4). The 2006 IPCC Guidelines (volume 3, page 2.33) state that "it is *good practice* to report emissions from the consumption of carbonates in the source category where the carbonates are consumed and the CO_2 emitted". During the review, Australia explained that the emissions from the consumption of carbonates cannot be included with their associated sectors, due to issues of confidentiality	Yes. Comparability*
		The ERT recommends that the Party report, in accordance with the 2006 IPCC Guidelines, the emissions from the use of carbonates in the category in which they are used, where possible, or justify the inclusion of the emissions under 2.A.4 other process uses of carbonates by explaining in the NIR that confidentiality reasons do not allow reporting the use of carbonates in the category in which they are used	
I.34	2.G.3 N_2O from product uses –	The previous review report (table 5, issue I.35) stated that a potential underestimation of N_2O emissions had occurred as Australia could not confirm whether imports of N_2O existed (see I.31 in	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
	N_2O	table 3 above). In the 2016 NIR, Australia states that it is planning to investigate this issue. During the review, Australia confirmed that imported N_2O is accounted for as the estimation method is based on the consumption of N_2O, instead of production only. The Party also provided confidential data indicating that, from 2003 onwards, one of the two N_2O producing plants in Australia ceased production and the Party started to import gas. Prior to that time, there were no imports of N_2O in Australia. Therefore, the ERT concludes that there is no underestimation of Australia's N_2O emissions from this category	
		The ERT recommends that the Party include in the NIR the information that from 2003 onwards, one of the two N_2O producing plants in Australia ceased production and the Party started to import N_2O and that for 2003 onwards, N_2O emissions from product uses are estimated based on imports in addition to domestic production	
Agriculture			
A.3	3. General (agriculture) – CH_4 and N_2O	The ERT noted that the Party is planning to implement an approach 2 uncertainty analysis in its inventory (NIR, chapter 1.6). During the review, the Party explained that the implementation of a Monte Carlo analysis for the agriculture sector is part of the national inventory improvement plan. The improvement plan for the agriculture sector identifies areas that require updating or review over the next two years	Not an issue
		The ERT welcomes the planned improvement and encourages the Party to implement an approach 2 uncertainty analysis for the agriculture sector in accordance with the timelines defined in the improvement plan	
A.4	3. General (agriculture) – CH_4 and N_2O	The ERT noted that the approach and assumptions used to derive the average annual livestock population data are not transparently described in the NIR. During the review, the Party clarified that the approach used for animals that are alive for a part of a complete year (e.g. feedlot cattle) is consistent with 2006 IPCC Guidelines, volume 4, equation 10.1	Yes. Transparency*
		The ERT recommends that the Party include in the NIR an explanation of the approach and assumptions (e.g. average life cycle of animal categories that are alive for part of a year only) used to derive the average annual livestock population	
A.5	3. General (agriculture) – CH_4 and N_2O	According to the NIR (section 5.3.9), Australia is going to develop a dynamic livestock model which accounts for livestock numbers based on births, deaths, slaughters and other stock changes. During the review, Australia clarified that the dynamic livestock model is only in the very early stages of its development. The plan is to develop this model based on the approach followed by the United States of America in its greenhouse gas inventory. The aim of the model will be to track individual age	Not an issue

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		cohorts of cattle from birth through to death or slaughter in terms of live weight and feed intake. The ERT considers that consistency with statistical data and with the 2006 IPCC Guidelines should be important considerations in the development of the model	
		The ERT encourages the Party to continue with the improvements to the accuracy of the livestock population data	
A.6	3.A.2 Sheep – CH_4	It is unclear from the NIR whether wool production, grazing in large areas and growing rate are taken into account in the estimation of the amount of feed consumed by sheep. During the review, the Party clarified that a country-specific method for estimating the amount of feed consumed by sheep (NIR, equation 3A.2_1) takes full account of the feed energy requirements identified by the ERT	Yes. Transparency*
		The ERT recommends that Australia include in the NIR the explanatory information provided to the ERT during the review, that is that the method for estimating the amount of feed consumed by sheep (NIR, equation 3A.2_1) takes full account of the feed energy requirements identified by the ERT such as wool production, grazing in large areas and growing rate	
A.7	3.A.2 Sheep – CH_4	Information on the drivers influencing inter-annual changes in the CH_4 IEFs for enteric fermentation of sheep, for example in 2007/2008 (2.5%), 2008/2009 (–3.0%) and 2010/2011 (–2.3%) is not included in the NIR. During the review, the Party explained that the IEFs fluctuate depending on changes in the sheep herd structure and the respective average live weights and feed intakes	Not an issue
		The ERT encourages the Party to include explanatory information in the NIR on the drivers that influence the inter-annual changes in the CH_4 IEFs for enteric fermentation of sheep, together with supporting charts (e.g. correlation analysis)	
A.8	3.B Manure management – CH_4	Information on the drivers influencing inter-annual changes in the CH_4 IEFs for cattle and swine manure management, such as 16.2% in 1999/2000 and 31.8% in 2004/2005 for cattle and –5.4% in 1994/1995, –5.8% in 1999/2000 and 7.7% in 2004/2005 for swine is not included in the NIR. During the review, the Party explained that the IEFs for cattle and swine manure management fluctuate depending on the herd structure and feed/production parameters of animals, as well as the manure distribution per AWMS	Not an issue
		The ERT encourages the Party to include explanatory information in the NIR on the drivers that influence the substantial inter-annual changes in the CH_4 IEFs for cattle and swine manure management, together with supporting charts (e.g. correlation analysis)	
A.9	3.B.1 Cattle –	The ERT noted that a reference for methane density 0.6784 kg/m^3 (NIR, volume 1, section 5.4.2) is not provided in the NIR. During the review, the Party responded that the methane density value is	Yes. Transparency*

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	CH_4	taken from the *National Greenhouse and Energy Reporting (Measurement) Determination.*[c] The methane density is measured on a dry gas basis with air pressure, temperature and density of 101.325 kilopascals, 15 °C and 1.225 kg/m^3, respectively The ERT recommends that the Party include in the NIR the reference for the methane density value	
A.10	3.B.1 Cattle – CH_4	The ERT noted that the reference for the country-specific data for the ash content in the manure of feedlot beef cattle (16%) is not provided in the NIR. During the review, the Party clarified that the ash content of 16% is used in the BeefBal mass balance approach to estimate the VS. The Party further stated that the value is based on measured data from Australia, and that the results of scientific research confirm the VS fractions in fresh manure of 79–88%, with an average of 83% (i.e. 17% of ash) The ERT recommends that Australia include the reference to the country-specific data for the ash content of manure in the NIR	Yes. Transparency*
A.11	3.B.1 Cattle – CH_4	According to CRF table 3.B(a) and the NIR (volume 1, section 5.4.4.1), the CH_4-producing potential (Bo) for feedlot beef cattle amounts to 0.19 m^3/kg VS, with a reference to the 2006 IPCC Guidelines. However, the ERT noted that the default Bo value for other cattle in Oceania presented in table 10A-5 of the 2006 IPCC Guidelines (volume 4) is 0.17 m^3/kg VS. During the review, the Party clarified that Australian feedlot systems are more similar to those used in North America than to those used in Oceania, which includes developing countries and less intensive agricultural practices. Therefore, the Party decided to use the IPCC default Bo value for North America (0.19 m^3/kg VS). The Party also informed the ERT that it has country-specific Bo data for cattle. However, given that a wide range of values was provided in the national study published in 2013 (0.14–0.3 m^3/kg VS) these Bo values were not used in the Party's GHG inventory. The ERT considers that the information provided by the Party demonstrates the similarity of agricultural conditions between Australia and North America The ERT recommends that the Party include information in the NIR on the justification of the use of the IPCC default Bo value for North America. The ERT further encourages the Party to continue investigating country-specific CH_4-producing potential values	Yes. Transparency*
A.12	3.C Rice cultivation – CH_4	The ERT noted that explanatory information regarding the scaling factor for the water regime prior to the cultivation period is not provided in the NIR. During the review, the Party provided the ERT with a reference[d] justifying that after rice harvesting Australian rice growers use the subsoil moisture remaining in the soil to plant either wheat or pasture for animals. Based on this evidence, it can be judged that the rice non-flooded pre-season exceeds 180 days	Yes. Transparency*

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		The ERT recommends that Australia include in the NIR the explanation of the water regime prior to the cultivation period (i.e. that after rice harvesting, Australian rice growers use the subsoil moisture remaining in the soil to plant either wheat or pasture for animals), with supporting references	
A.13	3.C Rice cultivation – CH_4	The ERT noted that the substantial increase in CH_4 emissions from rice cultivation in 2011 (412.29 kt CO_2 eq) compared with 2010 (92.39 kt CO_2 eq) is not explained in the NIR. During the review, the Party explained that the increase in emissions observed in 2011 occurred as a result of an increase in the area of rice cultivation following a period of prolonged drought	Not an issue
		The ERT encourages the Party to include an explanation in the NIR for the large inter-annual changes in emissions from rice cultivation	
A.14	3.D.a Direct N_2O emissions from managed soils – N_2O	The ERT noted an inconsistency between the NIR and CRF data regarding the N_2O EFs for animal manure applied to soils, urine and dung deposited by grazing animals, and N mineralization/immobilization associated with loss/gain of soil organic matter. In particular, according to the NIR (volume 1, sections 5.6.3, 5.6.5 and 5.6.7) the EFs for animal manure applied to soils, urine and dung deposited by grazing animals, and N mineralization/immobilization associated with loss/gain of soil organic matter are 0.01, 0.04 and 0.002 kg N_2O-N/kg N, respectively. However, CRF table 3.D includes IEFs of 0.009, 0.005 and 2.00 kg N_2O-N/kg N, respectively, for 2014. During the review, the Party explained that incorrect AD were reported in CRF table 3.D for these categories (i.e. categories 3.D.a.2.a, 3.D.a.3 and 3.D.a.5). However, the emissions reported in CRF table 3.D are correct and unaffected by the errors in the AD	Yes. Comparability*
		The ERT recommends that the Party report correct AD for N input from animal manure applied to soils, urine and dung deposited by grazing animals as well as N mineralization/ immobilization associated with loss/gain of soil organic matter in CRF table 3.D	
A.15	3.D.a.1 Inorganic N fertilizers – N_2O	The ERT noted that the comparison between the country-specific and FAO data for inorganic N fertilizer consumption showed that for the available years (the FAOSTAT database provides data for the period 2002–2013 only) the discrepancies for the periods 2002–2004 and 2006–2012 are insignificant (in the range of 0.001–0.9 per cent). However, for 2005 and 2013 substantial discrepancies are observed (6 and 7%, respectively). During the review, the Party stated that its fertilizer AD are supplied by the Fertilizer Industry Federation of Australia, and that without further details it is not possible to assess the source of the FAO data or the reasons for the discrepancies	Not an issue
		The ERT encourages Australia to conduct a comparison analysis of the national inorganic N fertilizer consumption data with the data from IFA and FAO, and report in the NIR explanations of any substantial discrepancies found, in line with the 2006 IPCC Guidelines (volume 4, page 11.26)	

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A.16	3.D.a.1 Inorganic N fertilizers – N_2O	Information on the drivers influencing inter-annual changes in the N_2O IEFs for inorganic fertilizers, such as 2001/2002 (6.8%), 2005/2006 (13.0%), 2009/2010 (–14.3%), 2010/2011 (9.2%), 2011/2012 (8.0%) and 2013/2014 (–13.9%) is not included in the NIR. During the review, the Party explained that the IEFs fluctuate depending on the proportion of inorganic N fertilizers applied per state, territory, and respective production system. Each state or territory has a unique fraction of N applied in each production system, and each production system has a unique EF The ERT encourages the Party to include explanatory information in the NIR on the drivers that influence the substantial inter-annual changes in the N_2O IEFs, with supporting charts (e.g. a correlation analysis)	Not an issue
A.17	3.D.b.2 Nitrogen leaching and run-off – N_2O	As stated in the NIR (section 5.6.10), the Party used the default fraction of N losses through leaching/run-off (0.3) provided in the 2006 IPCC Guidelines (volume 4, table 11.3). However, in CRF table 3.D (additional information), the Party used the notation key "NA" for $Frac_{LEACH-(H)}$ The ERT recommends that Australia report the applied value 0.3 for $Frac_{LEACH-(H)}$ instead of the notation key "NA" in CRF table 3.D	Yes. Comparability*
LULUCF			
L.26	4. General (LULUCF) – CO_2, CH_4 and N_2O	Australia presented tables in the NIR with detailed information on the impact of recalculations, including for forest land remaining forest land, in order to comply with issue L.1. The ERT commends Australia for presenting the individual quantitative impacts of recalculations. However, individual quantitative impacts in the recalculation tables (drivers) were not clearly linked to the description of the recalculations in chapter 10, volume 2, of the NIR The ERT encourages Australia to further improve transparency by cross-referencing recalculation tables and the description of the recalculations in NIR, volume 2, chapter 10	Not an issue
L.27	4. General (LULUCF) – CO_2, CH_4 and N_2O	In response to questions raised during the review and provisional main findings of the ERT, in its submission of 24 October 2016 Australia provided, for the first time, estimates for wetlands converted to cropland (232.12 kt CO_2 in 2014), wetlands converted to grassland (896.09 kt CO_2 in 2014), and settlements remaining settlements (–75.17 kt CO_2 in 2014 for living biomass; the carbon stock changes in DOM and soils were reported as "IE") for the entire time series. In the above-mentioned submission, Australia also corrected the notation key from "NE" (used in the original 2016 submission and in the 2015 inventory submission) to "NO" for settlements converted to cropland and settlements converted to grassland. Furthermore, the Party reported "NO" for land converted to other wetlands (reported as "IE" in the original 2016 submission and as "NE" in the	Yes. Transparency

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		2015 submission) The ERT agrees with the estimates and corrections to the notation keys included in the October submission, and recommends that Australia include in its NIR the descriptions, references and sources of information for the methodologies, assumptions, EFs and AD, as well as the rationale for the selection as wetlands converted to cropland, wetlands converted to grassland and settlements remaining settlements	
L.28	4. General (LULUCF) – CO_2, CH_4 and N_2O	Australia reports emissions and removals from all carbon pools in grassland converted to cropland as ”IE” (see L.4). The Party explained during the review that grassland converted to cropland is reported under cropland remaining cropland, because annual variations in area under cropping in Australian agricultural systems do not constitute a permanent land-use change The ERT recommends that Australia explain in the NIR and CRF table 9 that emissions and removals from grassland converted to cropland are reported under cropland remaining cropland because annual variations in area under cropping in Australian agricultural systems do not constitute a permanent land-use change	Yes. Transparency
L.29	4. General (LULUCF) – CO_2, CH_4 and N_2O	Australia reported the AD and carbon stock changes for several categories as “IE”: cropland, wetlands and settlements converted to forest land (all pools except organic soils, which are reported as “NO”); and cropland converted to grassland (all pools) and cropland and grassland converted to settlements (all pools). During the review, the Party explained that projects to provide separate estimates of emissions from such conversions are planned. The ERT welcomes the plan by Australia and considers that the disaggregation of estimates will improve transparency and comparability of Australia’s inventory The ERT recommends that Australia explain in the NIR and CRF table 9 under which categories the estimates for the following categories and pools are reported: cropland, wetlands and settlements converted to forest land (all pools except organic soils); cropland converted to grassland (all pools); and cropland and grassland converted to settlements (all pools). The ERT also recommends that Australia improve comparability and transparency in its future submissions by providing separate AD and estimates for the following categories and pools currently reported as “IE”: cropland, wetlands and settlements converted to forest land (all pools except organic soils); cropland converted to grassland (all pools); and cropland and grassland converted to settlements (all pools). Until this is done, the ERT recommends that Australia provide in its NIR an update of the status of its efforts to provide estimates for these pools	Yes. Comparability
L.30	4.G Harvested wood	The ERT noted that Australia did not report the AD and carbon stock changes in HWP for the period	Yes. Transparency

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	products – CO_2	1960–1989 in CRF table 4.Gs2	
		The ERT recommends that the Party complete CRF table 4.Gs2 and the additional information box on factors used to convert from product units to carbon. Parties can do this by setting a custom node year within the data entry screen for HWP in the CRF Reporter software	
Waste			
W.6	5.A.1.a Anaerobic – CH_4	Australia applied the FOD model to estimate CH_4 emissions from solid waste disposal on land in accordance with the 2006 IPCC Guidelines. Australia used the IPCC default delay time of six months and implemented the assumption that all waste was delivered in landfill at the midpoint of the year, which means that the decay was set to start, on average, on the first day of the year following deposition. During the 2015 review, the ERT noted that this assumption may lead to the misallocation of emissions between consecutive years. In the 2015 inventory review report, (finding W.5), the ERT encouraged Australia to assess the possibility of using monthly data in the FOD model. During the 2016 review, Australia explained that a project to assess the possibility of using monthly data in the FOD model will be undertaken for the 2017 annual submission	Not an issue
		The ERT reiterates the encouragement in the 2015 inventory review report (finding W.5) that Australia assess the use of monthly data in the FOD model and report thereon in its annual submission	
W.7	5.C.1 Waste incineration – CH_4 and N_2O	Regarding issue W.4, during the review, Australia provided, at the request of the ERT, the CH_4 and N_2O emissions from the incineration of clinical wastes and solvents, estimated using the highest default EFs provided in the 2006 IPCC Guidelines for waste incineration. The calculations showed that the annual emissions in the period 1990–2014 do not amount to more than 0.74 kt CO_2 eq and thus are well below the threshold provided in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines	Not an issue
		The ERT encourages Australia, in addition to explaining the magnitude of CH_4 and N_2O emissions from the incineration of clinical wastes and solvents in terms of the percentage of total emissions, to also include information in the NIR in units of kt CO_2 eq	
KP-LULUCF			
KL.4	Deforestation – CO_2, CH_4 and N_2O	According to decision 16/CMP.1, annex, paragraph 1(d) (in conjunction with decisions 6/CMP.9 and 3/CMP.11), “deforestation” under Article 3, paragraph 3, of the Kyoto Protocol is the direct human-induced conversion of forested land to non-forested land. Australia has elected to account for this activity annually. In its 2016 annual submission of 9 August 2016, Australia reported in CRF table 4.1 the AD for forest land (managed) to settlements and for forest land (managed) to wetlands	Yes. Transparency*

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		(managed) for the base year, and the years 2013 and 2014. Nonetheless, for these land-use changes, the carbon stock changes were reported as "NO" in the information item of CRF table 4(KP-I)A.2 in relation to the estimation of deforestation under the Kyoto Protocol During the review week, Australia stated that the use of the notation key "NO" in CRF table 4(KP-I)A.2 is not correct. The Party stated that both in the inventory reported under the Convention and in the reporting under the Kyoto Protocol, the conversion of forests to other land uses since 1990 (i.e. deforestation) includes the conversion of forests to cropland, grassland, wetlands and settlements Nevertheless, the ERT considered that there was still a lack of transparency regarding how the carbon stock changes from forest land converted to settlements and from forest land converted to wetlands were included under the activity "deforestation". The ERT considered that there was a potential underestimation of emissions from deforestation under Article 3, paragraph 3, of the Kyoto Protocol In its response to the list of potential problems and further questions raised by the ERT, Australia explained that it had reviewed and slightly revised the areas of forest land converted to grassland, wetlands and settlements, whereas the deforestation area was confirmed to be correct. However, the Party also revised the methodology used for the estimation of the carbon stock changes from deforestation. In particular, the Party used the method from the 2006 IPCC Guidelines (volume 4, page 7.20) to estimate the carbon stock changes due to deforestation in relation to forest land converted to wetlands. Australia provided revised estimates for deforestation in its submission of revised CRF tables on 24 October 2016. The net greenhouse gas emissions from deforestation provided in the 24 October 2016 submission were 199.39 kt CO_2 eq lower than in the 9 August 2016 submission for 2014 and 237.88 kt CO_2 eq lower for 2013. The ERT agreed with the revised estimates. The Party also reported the carbon stock changes in the information item of CRF table 4(KP-I)A.2 for wetlands and settlements under deforestation, which improved the transparency of the reporting The ERT recommends that the Party provide, in its NIR, a transparent description of the methodology used to estimate emissions and removals from deforestation. The ERT further recommends that the Party explain in the NIR how the areas subject to deforestation under the Kyoto Protocol are related to the areas of forest land converted to other land uses under the Convention	
KL.5	Forest management – CO_2	Regarding the treatment of natural disturbances to forest management, Australia selected the calibration period 2000–2012. According to decision 2/CMP.7, annex, paragraph 33(a), the period should include 1990–2009. Additionally, according to the Kyoto Protocol Supplement (page 2.46), "Parties are encouraged to use the longest available time series…[and] if including years after the period 1990-2009 the Party should take care to ensure that this does not cause inconsistencies related	Yes. Accuracy*

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		to policy assumptions (prior to December 2009) applied in the construction of the FMRL". During the review, Australia stated that the 1990s represented a period of relatively fewer wildfires compared to Australia's history. The Party further explained that fires even more significant than those since 2003 have been observed in Australia's history Considering the additional information presented by Australia on its long-term fire history, and acknowledging the impact of wildfires in Australia, the ERT recommends that Australia consider a longer time series (including the years 1990–2009) for determining the calibration period for applying the natural disturbance provision (e.g. using (part of) the information presented on wildfires for 1850–2009) and avoid restricting the calibration period to 2000–2012	
KL.6	Revegetation – CO_2	In accordance with Article 3, paragraph 4, of the Kyoto Protocol and decision 2/CMP.7, Australia elected to account for "revegetation" in the second commitment period of the Kyoto Protocol. Further, Australia elected to account for this activity for the entire commitment period, according to the original report to facilitate the calculation of the assigned amount pursuant to Article 3, paragraphs 7 bis, 8 and 8 bis, of the Kyoto Protocol (table 5, page 8) The ERT noted that decision 2/CMP.8, annex II, paragraph 2, lists the "[g]eneral information to be reported for activities under Article 3, paragraph 3, forest management under Article 3, paragraph 4, and any elected activities under Article 3, paragraph 4" as part of the annual submission, including: (a) (Para. 2(a)): information on how inventory methodologies have been applied taking into account the 2006 IPCC Guidelines, and any relevant supplementary methodological guidance developed by the IPCC and adopted by the CMP and COP (b) (Para. 2(b)): information on the geographical location of the boundaries of the areas, including those of land subject to any elected activities under Article 3, paragraph 4 The ERT noted that in its annual submission, Australia did not provide the information required in paragraph 2(a) and (b) above. Australia's 2016 NIR (volume 3, section 11.9, page 62) includes the following information on the activity "revegetation": "Revegetation will potentially include net emissions from areas of vegetation that do not constitute a forest and which occur on non-grazing or cropping lands. No estimates have been made of these activities for this report" During the review week, the Party stated that Australia has systems in place to spatially identify KP-LULUCF activities using satellite imagery and model emissions/removals from human-induced subforest vegetation gain on wetlands and settlements to enable the estimation and reporting of net emissions in the future. The Party further referred to section 6.8.1.2 (grass and shrub transitions) of the 2016 NIR (volume 2)	Yes. Transparency*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
		The ERT considered that the information provided in the annual submission and during the review week, was not sufficient to fulfil the reporting requirements in decision 2/CMP.8, annex II, paragraph 2(a) and (b), in particular regarding how the inventory methodologies are applied and how the geographical location of the areas is identified. Therefore, the ERT considered that Australia was not fulfilling its mandatory reporting obligations in accordance with annex II to decision 2/CMP.8 In its response to the list of potential problems and further questions raised by the ERT, Australia submitted revised CRF tables on 24 October 2016, including preliminary estimates for CO_2 emissions from revegetation in the base year (105.38 kt CO_2), 2013 (–116.05 kt CO_2) and 2014 (–122.17 kt CO_2). The Party explained that "revegetation" activity includes sparse woody vegetation (i.e. woody vegetation that does not constitute forest) in wetlands and settlements. However, the ERT considered that the explanation was insufficiently detailed with regard to how revegetation activities in wetlands and settlements do not meet the definition of forest Further, Australia provided a description of the IPCC methods used to elaborate the preliminary estimates by referring to the NIR (volume 2, section 6.8.1.2), which includes information on sparse woody vegetation for the activity grazing land management under the Kyoto Protocol. The Party also provided information on the land areas subject to revegetation and explained that they are identified using the same monitoring system as that used for grazing land management. The ERT agreed with the preliminary estimates and considered that the information provided by the Party resolved the potential problem identified in relation to the information required in decision 2/CMP.8, annex II, paragraph 2(a) and (b) The ERT recommends that the Party review the preliminary methodology and data sources used for revegetation and revise them, if appropriate (see also KL.7 below). The ERT further recommends that Australia improve transparency by explaining, in the NIR, the methods and data sources used to estimate the carbon stock changes in revegetation. Further, the ERT recommends that Australia explain how the definition contained in decision 16/CMP.1, annex, chapter C (in conjunction with decisions 6/CMP.9 and 3/CMP.11), for revegetation, is associated with Australia's reporting on the land-use categories under the Convention, and explain how revegetation in settlements and wetlands does not meet the definition of forest	
KL.7	Revegetation – CO_2	In the NIR, Australia identified the processing of remaining areas of sparse woody vegetation for parts of central Australia to complete the national coverage as a planned improvement in the remote sensing programme (volume 2, section 6.A.6, page 128). Further, section 6.8.1.2 of the NIR (volume 2, page 81) states that the coverage of sparse woody vegetation areas extends for the period from 1989 to 2014, except for a few interior rangeland areas, for which current sparse woody vegetation coverage is limited to 2006. During the review, Australia stated that the data to fill the gap in sparse	Yes. Accuracy*

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue[a] and/or a problem[b]? If yes, classify by type*
		woody vegetation data for the map sheets of Australia's national monitoring system, for the period 2006–2014, have been extrapolated following the 2006 IPCC Guidelines (volume 1, chapter 5, page 5.13), ensuring complete coverage of activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, and that the corresponding emissions and removals have been included in the inventory. Australia further explained that it is currently updating the sparse woody vegetation data for a further five map sheets, which are expected to be completed by June 2017. The remaining seven map sheets (which have not been mapped for the entire time series) mostly consist of other lands (arid desert country) with no net change in emissions	
		The ERT recommends that Australia continue to work on updating the sparse woody vegetation data for any remaining map sheets in order to achieve a complete land representation of sparse woody vegetation, as these areas may be subject to revegetation activity under Article 3, paragraph 4, of the Kyoto Protocol	
KL.8	Harvested wood products – CO_2	According to decision 2/CMP.7, annex, paragraph 30, a Party may use country-specific data to replace the default half-lives for the estimation of HWP, provided that verifiable and transparent AD are available and that the methodologies used are at least as detailed or accurate as those prescribed in decision 2/CMP.7, annex, paragraph 29. Section 6.12 of the NIR (volume 2) describes the methodology used for estimating emissions from HWP using a national wood products model. In the NIR, Australia presented information on country-specific lifespan pools assumed for the carbon model (volume 2, page 99). Table 6.53 also presents information on decomposition rates and maximum possible loss for five pools in HWP. Additionally, CRF table 4(KP-I)C defines the following values as half-lives of each product type: 18.32 (domestically consumed sawnwood), 15.50 (exported sawnwood), 4.21 (domestically consumed wood panels), 6.51 (exported wood panels) and 0.69 (pulp and paper) years. The ERT was unable to reconstruct the half-lives in the CRF tables based on the information presented in the NIR. During the review, Australia explained that a tier 3 country-specific model for HWP was applied, as described in the NIR, and that it has been using these country-specific decay parameters since 2006. The ERT considered that the information provided during the review did not improve the transparency of the Party's reporting	Yes. Transparency*
		The ERT recommends that Australia document the process for deriving the country-specific half-lives for HWP and provide information to justify that the methodologies used are at least as detailed or accurate as those prescribed in decision 2/CMP.7, annex, paragraph 29	
KL.9	Harvested wood products – CO_2	In accordance with decision 2/CMP.7, annex, paragraph 31, HWP resulting from deforestation shall be accounted for on the basis of instantaneous oxidation. During the review week, Australia confirmed that "…most HWP associated with potential deforestation events are produced from hardwood plantations established in response to favourable government policy after 1990, which are	Yes. Transparency*

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue[a] and/or a problem[b]? If yes, classify by type
		harvested and then on occasion not replanted. Most of the products from these plantations are exported for paper and pulp production with very short product lives that approximates, in any case, instant oxidation (consistent with the relatively small net sink from HWP in AR)". The ERT considers that this is not in line with decision 2/CMP.7, annex, paragraph 31, and included this issue in the list of potential problems and further questions raised by the ERT during the review	
		In response to the list of potential problems and further questions, Australia confirmed that emissions from HWP from deforestation were accounted for on the basis of instantaneous oxidation in its submission of 9 August 2016. However, when investigating the issue, Australia had identified double counting of emissions, which had occurred when considering HWP from deforestation and from afforestation/reforestation, and forest management. According to Australia, this was due to the use of forestry and wood product industry absolute production data to calculate the carbon stored in HWP, which do not easily distinguish between the sources of wood under the Kyoto Protocol accounting rules. In its 9 August 2016 submission, Australia had assumed that all plantation hardwood-related production since 2000 was attributable to afforestation/reforestation and all other production was attributable to forest management. This treatment presumed that deforestation events produced no wood products. In order to resolve the double counting of emissions, Australia provided revised estimates in a submission of the revised CRF tables on 24 October 2016. In the revised estimates, Australia modelled the proportion of production of HWP that should be attributed to deforestation, and deducted such amounts from the amount of HWP from afforestation/reforestation and forest management lands. In the revised estimates, the net carbon stock change in HWP was 29.26 kt CO_2 lower for afforestation/reforestation and 406.66 kt CO_2 lower for forest management for 2014 compared to the 9 August 2016 submission. The corresponding differences for 2013 were 35.71 kt CO_2 (afforestation/reforestation) and 347.00 kt CO_2 (forest management). The ERT agreed with the revised estimates	
		The ERT recommends that Australia describe, in the NIR, the methodology used to distinguish HWP from deforestation from afforestation/reforestation and from forest management. The ERT further recommends that Australia transparently explain that HWP from deforestation is accounted for on the basis of instantaneous oxidation	

Abbreviations: AD = activity data, AWMS = animal waste management system, Bo = methane-producing capacity, BeefBal = nutrient mass balance model for beef cattle feedlots, CER = certified emission reduction, CMP = Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, COP = Conference of the Parties, CRF = common reporting format, DOM = dead organic matter, EF = emission factor, ERT = expert review team, FAO = Food and Agriculture Organization of the United Nations, FOD = first-order decay, $Frac_{LEACH-(H)}$ = fraction of N input to managed soils that is lost through leaching and run-off, GHG = greenhouse gas, HWP = harvested wood products, IE = included elsewhere, IEA = International Energy Agency, IEF = implied emission factor, IFA = International Fertilizer Industry Association, IPCC = Intergovernmental Panel on Climate Change, IPPU = industrial processes and product use, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, Kyoto Protocol Supplement = *2013*

Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol, LULUCF = land use, land-use change and forestry, N = nitrogen, NA = not applicable, NE = not estimated, NGER = National Greenhouse and Energy Reporting Scheme, NGL = natural gas liquids, NIR = national inventory report, NO = not occurring, SIAR = standard independent assessment report, UNFCCC Annex I inventory reporting guidelines = "Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories", VS = volatile solids, 2006 IPCC Guidelines = *2006 IPCC Guidelines for National Greenhouse Gas Inventories*.

[a] Recommendations are related to issues as defined in decision 13/CP.20, annex, paragraph 81, or problems as identified in decision 22/CMP.1, annex, paragraph 69, identified by the ERT during the review. Encouragements are made to the Party to address all findings not related to such issues.

[b] An asterisk is included next to each issue type that is also a problem, as defined in decision 22/CMP.1, annex, paragraphs 68 and 69, including those that lead to an adjustment or a question of implementation.

[c] <https://www.legislation.gov.au/Series/F2008L02309>.

[d] <http://www.rga.org.au/the-rice-industry.aspx>.

VI. Application of adjustments

10. The ERT has not identified the need to apply any adjustments to the 2016 annual submission of Australia.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

11. Australia has elected annual accounting for afforestation/reforestation and deforestation. Annex I shows the accounting quantities for KP-LULUCF as reported by the Party for afforestation/reforestation and deforestation and the final values after the review. The final quantity of units to be issued and cancelled are presented in the same annex.

12. Australia has elected commitment period accounting for forest management, cropland management, grazing land management and revegetation and therefore the issuance and cancellation of units for activities under Article 3, paragraph 4, of the Kyoto Protocol are not applicable for the 2016 review.

VIII. Questions of implementation

13. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for Australia for submission year 2016 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

1. Tables 6–9 provide an overview of total greenhouse gas emissions and removals, as submitted by Australia.

Table 6
Total greenhouse gas emissions for Australia, base year[a] –2014[b]
(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[c]*		*Land-use change (Article 3.7bis as contained in the Doha Amendment)[d]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[e]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								4 700.00
Base year	547 595.93	418 623.05	547 595.93	418 623.05	148 163.36		1 741.37	
1990	547 595.93	418 623.05	547 595.93	418 623.05				
1995	480 420.85	433 478.65	480 420.85	433 478.65				
2000	549 951.53	483 445.83	549 951.53	483 445.83				
2010	555 692.08	533 917.44	555 692.08	533 917.44				
2011	541 159.03	534 089.80	541 159.03	534 089.80				
2012	540 425.61	537 377.57	540 425.61	537 377.57				
2013	529 947.64	526 882.67	529 947.64	526 882.67		30 993.49	–2 624.73	–9 631.95
2014	523 879.77	522 397.09	523 879.77	522 397.09		26 001.37	–1 870.76	–14 118.78

Abbreviations: CM = cropland management, FM = forest management, FMRL = forest management reference level, GHG = greenhouse gas, GM = grazing land management, KP-LULUCF = LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, LULUCF = land use, land-use change and forestry, RV = revegetation, WDR = wetland drainage and rewetting.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year for cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990. For activities under Article 3, paragraph 3, of the Kyoto Protocol and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[c] The Party has not reported indirect CO_2 emissions in common reporting format table 6.

[d] The value reported in this column refers to 1990.

[e] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely afforestation and reforestation, and deforestation.

Table 7
Greenhouse gas emissions by gas for Australia, excluding land use, land-use change and forestry, 1990–2014[a]
(kt CO_2 eq)

	CO_2[b]	*CH_4*	*N_2O*	*HFCs*	*PFCs*	*Unspecified mix of HFCs and PFCs*	*SF_6*	*NF_3*
1990	278 265.90	118 768.84	15 345.60	1 424.68	4 607.01	NO	211.02	NE, NO
1995	305 162.54	109 900.74	15 578.20	1 004.03	1 530.84	NO	302.31	NE, NO
2000	349 885.43	111 520.31	18 949.17	1 613.20	1 287.06	NO	190.65	NE, NO
2010	406 200.99	99 447.73	19 698.30	8 166.07	283.32	NO	121.03	NE, NO
2011	403 705.53	101 085.54	20 034.58	8 837.85	301.30	NO	125.00	NE, NO
2012	406 462.85	100 796.84	20 342.38	9 353.07	294.88	NO	127.55	NE, NO
2013	396 913.94	99 857.20	19 756.45	10 034.13	192.00	NO	128.94	NE, NO
2014	393 126.95	98 076.11	20 084.54	10 787.35	192.54	NO	129.61	NE, NO
Per cent change 1990–2014	**41.3**	**–17.4**	**30.9**	**657.2**	**–95.8**	**NA**	**–38.6**	**NA**

Abbreviations: NA = not applicable, NE = not estimated, NO = not occurring.
[a] Emissions/removals reported in the sector other (sector 6) are not included in total greenhouse gas emissions.
[b] Australia did not report indirect CO_2 emissions in common reporting format table 6.

Table 8
Greenhouse gas emissions by sector for Australia, 1990–2014[a, b]
(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1990	292 802.45	26 108.52	80 060.54	128 972.88	19 651.53	NO
1995	317 144.49	25 261.35	72 482.54	46 942.20	18 590.27	NO
2000	362 749.43	26 751.98	78 528.19	66 505.71	15 416.22	NO
2010	417 059.50	35 386.79	66 552.07	21 774.64	14 919.07	NO
2011	413 090.56	35 969.86	70 724.40	7 069.23	14 304.98	NO
2012	418 737.45	33 855.87	72 134.75	3 048.03	12 649.49	NO
2013	410 102.89	32 505.51	72 406.07	3 064.98	11 868.20	NO
2014	405 595.41	32 415.75	72 383.41	1 482.68	12 002.53	NO
Per cent change 1990–2014	**38.5**	**24.2**	**–9.6**	**–98.9**	**–38.9**	**NA**

Abbreviations: IPPU = industrial processes and product use, LULUCF = land use, land-use change and forestry, NA = not applicable, NO = not occurring.

[a] Emissions/removals reported in the sector other (sector 6) are not included in total greenhouse gas emissions.

[b] Australia did not report indirect CO_2 emissions in common reporting format table 6.

Table 9

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a, b] –2014, for Australia

(kt CO_2 eq)

	Article 3.7bis as contained in the Doha Amendment[c]	*Article 3.3 of the Kyoto Protocol*		*Forest management and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*Afforestation and reforestation*	*Deforestation*	*Forest management*	*Cropland management*	*Grazing land management*	*Revegetation*	*Wetland drainage and rewetting*
FMRL				4 700.00				
Technical correction				–4 784.69				
Base year	148 163.36				163.39	1 472.60	105.38	NA
2013		–9 908.80	40 902.29	–9 631.95	–1 660.60	–848.08	–116.05	NA
2014		–7 359.69	33 361.06	–14 118.78	–697.57	–1 051.02	–122.17	NA
Per cent change base year–2014					**–526.9**	**–171.4**	**–215.9**	**NA**

Abbreviations: FMRL = forest management reference level, NA = not applicable.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for all gases. The base year for cropland management, grazing land management and revegetation under Article 3, paragraph 4, of the Kyoto Protocol is 1990 for Australia. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and forest management under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] Values in this table include emissions on lands subject to natural disturbances, if applicable.

[c] The value reported in this column refers to 1990.

2. Table 10 provides information on the accounting quantities for reporting under Article 3, paragraph 3, of the Kyoto Protocol, as reported by the Party, and the final values after the review. For activities under Article 3, paragraph 4, of the Kyoto Protocol, Australia elected commitment period accounting; therefore, the annual accounting quantities for these activities are not relevant and are reported as "NA" (not applicable).

Table 10

Accounting quantities for activities under Article 3, paragraph 3, and forest management and any elected activities under Article 3, paragraph 4, of the Kyoto Protocol, for Australia

	Base year[a]	*Net emissions/removals*			*Accounting parameters*	*Accounting quantity*[c]
Greenhouse gas source and sink activities		*2013*	*2014*	*Total*[b]		
		kt CO_2 eq				
A.1. Afforestation/reforestation		–9 908.801	–7 359.691	–17 268.492		–17 268.492
Excluded emissions from natural disturbances[d]		NA	NA	NA		NA
Excluded subsequent removals from land subject to natural disturbances		NA	NA	NA		NA
A.2. Deforestation		40 902.295	33 361.064	74 263.358		74 263.358
B.1. Forest management		NA	NA	NA		NA
Net emissions/removals		NA	NA	NA		
Excluded emissions from natural disturbances[d]		NA	NA	NA		NA
Excluded subsequent removals from land subject to natural disturbances		NA	NA	NA		NA
Any debits from CEF-ne		NA	NA	NA		NA
FMRL[e]					NA	
Technical corrections to FMRL					NA	
Forest management cap					NA	NA
B.2. Cropland management (if elected)	NA	NA	NA	NA		NA

Greenhouse gas source and sink activities	*Base year*[a]	*Net emissions/removals*			*Accounting parameters*	*Accounting quantity*[c]
		2013	*2014*	*Total*[b]		
		kt CO_2 eq				
B.3. Grazing land management (if elected)	NA	NA	NA	NA		NA
B.4. Revegetation (if elected)	NA	NA	NA	NA		NA
B.5. Wetland drainage and rewetting (if elected)	NA	NA	NA	NA		NA

Abbreviations: CEF-ne = newly established forest, FMRL = forest management reference level, NA = not applicable.

[a] Net emissions and removals from cropland management, grazing land management, revegetation and/or wetland drainage and rewetting, if elected, in the Party's base year, as established by decision 9/CP.2.

[b] Cumulative net emissions and removals for all years of the commitment period reported in the current submission.

[c] The accounting quantity is the total quantity of units to be added to or subtracted from a Party's assigned amount for a particular activity in accordance with the provisions of Article 7, paragraph 4, of the Kyoto Protocol.

[d] The Party does not intend to apply the provision to exclude emissions from natural disturbances for the accounting of afforestation and reforestation. The Party has indicated it is excluding emissions from natural disturbances for the accounting of forest management at the end of the commitment period.

[e] Forest management reference level as inscribed in the appendix of the annex to decision 2/CMP.7, in kt CO_2 eq per year.

3. Table 11 provides an overview of relevant key data for Australia's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 11
Key relevant data for Australia under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) Afforestation/reforestation: annual accounting (b) Deforestation: annual accounting (c) Forest management: commitment period accounting (d) Cropland management: commitment period accounting (e) Grazing land management: commitment period accounting (f) Revegetation: commitment period accounting (g) Wetland drainage and rewetting: not elected
Election of activities under Article 3, paragraph 4	Cropland management, grazing land management and revegetation
Election of application of provisions for natural disturbances	Yes, for forest management
3.5% of total base year GHG emissions, excluding LULUCF and including indirect CO_2 emissions	14 651.806 kt CO_2 eq (117 214.453 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. Afforestation and reforestation in 2014	Issue 7 359 691 RMUs
2. Deforestation in 2014	Cancel 33 361 064 units
3. Forest management in 2014	NA
4. Cropland management in 2014	NA
5. Grazing land management in 2014	NA
6. Revegetation in 2014	NA
7. Wetland drainage and rewetting in 2014	NA
1. Afforestation and reforestation in 2013	Issue 9 908 801 RMUs
2. Deforestation in 2013	Cancel 40 902 295 units
3. Forest management in 2013	NA
4. Cropland management in 2013	NA
5. Grazing land management in 2013	NA
6. Revegetation in 2013	NA
7. Wetland drainage and rewetting in 2013	NA

Abbreviations: AAU = assigned amount unit, CER = certified emission reduction, ERU = emission reduction unit, GHG = greenhouse gas, LULUCF = land use, land-use change and forestry, NA = not applicable, RMU = removal unit.

Annex II

Information to be included in the compilation and accounting database

Tables 12 and 13 include the information to be included in the compilation and accounting database for Australia. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable), as well as the final data to be included in the compilation and accounting database.

Table 12
Information to be included in the compilation and accounting database for 2014, including the commitment period reserve, for Australia
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Commitment period reserve	4 019 293 318	4 060 457 844		4 060 457 844
Annex A emissions for 2014				
CO_2	393 126 947			393 126 947
CH_4	98 076 109			98 076 109
N_2O	20 084 543			20 084 543
HFCs	10 787 350			10 787 350
PFCs	192 536			192 536
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	129 605			129 605
NF_3	NE, NO			NE, NO
Total Annex A sources	**522 397 091**			**522 397 091**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 Afforestation and reforestation	–7 337 606	–7 359 691		–7 359 691
3.3 Deforestation	34 124 433	33 361 064		33 361 064
Forest management and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 Forest management for 2014	–17 385 244	–14 118 777		–14 118 777
3.4 Cropland management for 2014	–926 899	–697 569		–697 569
3.4 Cropland management for the base year	–68 729	163 388		163 388
3.4 Grazing land management for 2014	2 242 741	–1 051 021		–1 051 021
3.4 Grazing land management for the base year	8 310 499	1 472 600		1 472 600
3.4 Revegetation for 2014	NE	–122 175		–122 175
3.4 Revegetation in the base year	NE	105 381		105 381

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NE = not estimated, NO = not occurring.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

Table 13
Information to be included in the compilation and accounting database for 2013, for Australia
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*[a]	*Final*[b]
Annex A emissions for 2013				
CO_2	396 913 937			396 913 937
CH_4	99 857 205			99 857 205
N_2O	19 756 453			19 756 453
HFCs	10 034 128			10 034 128
PFCs	192 001			192 001
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	128 945			128 945
NF_3	NE, NO			NE, NO
Total Annex A sources	**526 882 667**			**526 882 667**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 Afforestation and reforestation	–9 922 861	–9 908 801		–9 908 801
3.3 Deforestation	40 670 398	40 902 295		40 902 295
Forest management and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 Forest management for 2013	–9 954 412	–9 631 946		–9 631 946
3.4 Cropland management for 2013	–1 884 306	–1 660 600		–1 660 600
3.4 Cropland management for the base year	–68 729	163 388		163 388
3.4 Grazing land management for 2013	2 453 659	–848 080		–848 080
3.4 Grazing land management for the base year	8 310 499	1 472 600		1 472 600
3.4 Revegetation for 2013	NE	–116 055		–116 055
3.4 Revegetation in the base year	NE	105 381		105 381

Abbreviations: Annex A sources = sources included in Annex A to the Kyoto Protocol, NE = not estimated, NO = not occurring.
[a] "Adjustment" is relevant only for Parties for which the expert review team has calculated one or more adjustment(s).
[b] "Final" includes revised estimates, if any, and/or adjustments, if any.

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the Intergovernmental Panel on Climate Change (IPCC) *2006 IPCC Guidelines for National Greenhouse Gas Inventories* that were reported as "NE" (not estimated) or for which the expert review team otherwise determined that there may be an issue with the completeness of reporting in the Party's inventory are the following:

CO_2, CH_4 and N_2O emissions from land converted to forest land (4.A.2) (see L.9).

Annex IV

Documents and information used during the review

A. Reference documents

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at <http://unfccc.int/resource/webdocs/agi/2015.pdf>.

Annual status report for Australia for 2016. Available at <http://unfccc.int/resource/docs/2016/asr/aus.pdf>.

FCCC/ARR/2015/AUS. Report on the individual review of the annual submission of Australia submitted in 2015. Available at <http://unfccc.int/resource/docs/2016/arr/aus.pdf>.

FCCC/ARR/2014/AUS. Report on the individual review of the annual submission of Australia submitted in 2014. Available at <http://unfccc.int/resource/docs/2015/arr/aus.pdf>.

FCCC/ARR/2013/AUS. Report of the individual review of the annual submission of Australia submitted in 2013. Available at <http://unfccc.int/resource/docs/2014/arr/aus.pdf>.

FCCC/ARR/2012/AUS. Report of the individual review of the annual submission of Australia submitted in 2012. Available at <http://unfccc.int/resource/docs/2013/arr/aus.pdf>.

“Guidelines for national systems for the estimation of anthropogenic greenhouse gas emissions by sources and removals by sinks under Article 5, paragraph 1, of the Kyoto Protocol”. Decision 19/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=14>.

“Guidelines for review under Article 8 of the Kyoto Protocol”. Decision 22/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf#page=51>.

“Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories”. Annex to decision 24/CP.19. Available at <http://unfccc.int/resource/docs/2013/cop19/eng/10a03.pdf#page=4>.

“Guidelines for the preparation of the information required under Article 7 of the Kyoto Protocol”. Decision 15/CMP.1. Available at <http://unfccc.int/resource/docs/2005/cmp1/eng/08a02.pdf#page=54>.

“Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention”. Annex to decision 13/CP.20. Available at <http://unfccc.int/resource/docs/2014/cop20/eng/10a03.pdf#page=6>.

“Implications of the implementation of decisions 2/CMP.7 to 4/CMP.7 and 1/CMP.8 on the previous decisions on methodological issues related to the Kyoto Protocol, including those relating to Articles 5, 7 and 8 of the Kyoto Protocol, part I: implications related to accounting and reporting and other related issues”. Decision 3/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf#page=5>.

"Implications of the implementation of decisions 2/CMP.7 to 4/CMP.7 and 1/CMP.8 on the previous decisions on methodological issues related to the Kyoto Protocol, including those relating to Articles 5, 7 and 8 of the Kyoto Protocol, part II: implications related to review and adjustments and other related issues". Decision 4/CMP.11. Available at <http://unfccc.int/resource/docs/2015/cmp11/eng/08a01.pdf#page=30>.

Intergovernmental Panel on Climate Change. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. Available at <http://www.ipcc–nggip.iges.or.jp/public/2006gl/index.html>.

Intergovernmental Panel on Climate Change. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. Available at <http://www.ipcc–nggip.iges.or.jp/public/kpsg>.

Intergovernmental Panel on Climate Change. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. Available at <http://www.ipcc–nggip.iges.or.jp/public/wetlands/index.html>.

Standard independent assessment report, part 1, for Australia for 2016. Available at <http://unfccc.int/files/kyoto_mechanisms/application/pdf/siar_2016_aus_1_2.pdf>.

Standard independent assessment report, part 2, for Australia for 2016. Available at <http://unfccc.int/files/kyoto_mechanisms/application/pdf/siar_2016_aus_2_2.pdf>.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Rob Sturgiss (Department of the Environment, Government of Australia), including additional material on the methodology and assumptions used. The following documents[1] were also provided by Australia:

Australian Government, Department of the Environment. 2016. *Australian National Greenhouse Gas Accounts. Australia's National Inventory System. Evaluation of Outcomes 2015-16.*

[1] Reproduced as received from the Party.

Annex V

Acronyms and abbreviations

AAU	assigned amount unit
AD	activity data
Annex A sources	sources included in Annex A to the Kyoto Protocol
AWMS	animal waste management system
Bo	methane-producing capacity
BeefBal	nutrient mass balance model for beef cattle feedlots
C	confidential
CaO	calcium oxide
CEF-ne	newly established forest
CER	certified emission reduction
CH_4	methane
CM	cropland management
CMP	Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol
COP	Conference of the Parties
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
DOM	dead organic matter
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
FAO	Food and Agriculture Organization of the United Nations
F-gases	fluorinated gases
FMRL	forest management reference level
FOD	first-order decay
$Frac_{LEACH-(H)}$	fraction of N input to managed soils that is lost through leaching and run-off
FM	forest management
FMRL	forest management reference level
FullCAM	Full Carbon Accounting Model
GHG	greenhouse gas
GM	grazing land management
HWP	harvested wood products
IE	included elsewhere
IEA	International Energy Agency
IEF	implied emission factor
IFA	International Fertilizer Industry Association
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
kg	kilogram
KP-LULUCF	LULUCF emissions and removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
kt	kilotonne
LULUCF	land use, land-use change and forestry
MgO	magnesium oxide
MSW	municipal solid waste
N	nitrogen
NA	not applicable
NE	not estimated
NF_3	nitrogen trifluoride
NGER	National Greenhouse and Energy Reporting Scheme
NGL	natural gas liquids

NIR	national inventory report
NO	not occurring
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SEF	standard electronic format
SF_6	sulphur hexafluoride
SIAR	standard independent assessment report
UNFCCC	United Nations Framework Convention on Climate Change
VS	volatile solids
WDR	wetland drainage and rewetting