United Nations

Framework Convention on Climate Change

FCCC/SBI/ICA/2022/TASR.3/IDN

Distr.: General
24 January 2023

English only

Technical analysis of the third biennial update report of Indonesia submitted on 20 December 2021

Summary report by the team of technical experts

Summary

According to decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention, consistently with their capabilities and the level of support provided for reporting, were to submit their first biennial update report by December 2014. Further, paragraph 41(f) of that decision states that Parties not included in Annex I to the Convention shall submit a biennial update report every two years, either as a summary of parts of their national communication in the year in which the national communication is submitted or as a stand-alone update report. As mandated, the least developed country Parties and small island developing States may submit biennial update reports at their discretion. This summary report presents the results of the technical analysis of the third biennial update report of Indonesia, conducted by a team of technical experts in accordance with the modalities and procedures contained in the annex to decision 20/CP.19.

Please recycle

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AD	activity data
AFOLU	agriculture, forestry and other land use
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BUR	biennial update report
CF_4	tetrafluoromethane
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
EF	emission factor
F-gas	fluorinated gas
FOLU	forestry and other land use
GHG	greenhouse gas
GIZ	German Agency for International Cooperation
GWP	global warming potential
HFC	hydrofluorocarbon
HWP	harvested wood products
ICA	international consultation and analysis
INC	initial national communication
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPCC good practice guidance for LULUCF	*Good Practice Guidance for Land Use, Land-Use Change and Forestry*
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
N_2O	nitrous oxide
NA	not applicable
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NMVOC	non-methane volatile organic compound
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
NO_X	nitrogen oxides
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
SF_6	sulfur hexafluoride
TTE	team of technical experts

UNFCCC guidelines for the preparation of NCs from non-Annex I Parties	"Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention"
UNFCCC reporting guidelines on BURs	"UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention"

I. Introduction and process overview

A. Introduction

1. The process of ICA consists of two steps: a technical analysis of the submitted BUR and a facilitative sharing of views under the Subsidiary Body for Implementation, resulting in a summary report and a record, respectively.

2. According to decision 2/CP.17, paragraph 41(a), non-Annex I Parties, consistently with their capabilities and the level of support provided for reporting, were to submit their first BUR by December 2014. In addition, paragraph 41(f) of that decision states that non-Annex I Parties shall submit a BUR every two years, either as a summary of parts of their NC in the year in which the NC is submitted or as a stand-alone update report.

3. Further, according to paragraph 58(a) of the same decision, the first round of ICA is to commence for non-Annex I Parties within six months of the submission of the Parties' first BUR. The frequency of developing country Parties' participation in subsequent rounds of ICA, depending on their respective capabilities and national circumstances, and the special flexibility for small island developing States and the least developed country Parties, will be determined by the frequency of the submission of BURs.

4. Decision 14/CP.19, paragraph 7, outlines that developing country Parties seeking to obtain and receive payments for results-based actions can submit relevant information and data through the BUR in the form of a technical annex as per decision 2/CP.17, annex III, paragraph 19.[1] Decision 14/CP.19, paragraph 8, outlines that the submission of the technical annex is voluntary and in the context of results-based payments. As mandated by decision 14/CP.19, paragraphs 10–14, the technical annex submitted by Indonesia has been subject to technical analysis by two LULUCF experts who are included as members of a TTE. The results of the technical analysis are captured in a separate technical report.[2]

5. Indonesia submitted its second BUR on 21 December 2018, which was analysed by a TTE in the thirteenth round of technical analysis of BURs from non-Annex I Parties, conducted from 27 to 31 May 2019. After the publication of its summary report, Indonesia participated in the ninth workshop for the facilitative sharing of views, convened remotely from 24 to 27 November 2020.

6. This summary report presents the results of the technical analysis of the third BUR of Indonesia, undertaken by a TTE in accordance with the provisions on the composition, modalities and procedures of the TTE under ICA contained in the annex to decision 20/CP.19.

B. Process overview

7. In accordance with the mandate referred to in paragraph 2 above, Indonesia submitted its third BUR on 20 December 2021 as a stand-alone update report. The submission was made within three years from the submission of the second BUR.

8. During the technical analysis, the Party clarified that, owing to a delay caused by the coronavirus disease 2019 pandemic, data collection and consolidation for the GHG inventory and mitigation actions took longer than expected.

9. A desk analysis of Indonesia's BUR was conducted remotely from 4 to 8 April 2022 and was undertaken by the following TTE, drawn from the UNFCCC roster of experts on the basis of the criteria defined in decision 20/CP.19, annex, paragraphs 2–6: Asia Adlan Mohamed Abdalla (Sudan), Njangu Lewis Aldo Jr. (Liberia), Dawa Chhoedron (Bhutan), Paulo Cornejo (Chile), Magdalena Jóźwicka-Olsen (member of the Consultative Group of Experts from the European Union), Mwangi James Kinyanjui (Kenya), Fui Pin Koh (Malaysia), Naoki Matsuo (Japan), Tahira Munir (Pakistan), Phuong-Nam Nguyen

[1] The technical annex on the results of implementing REDD+ activities.

[2] FCCC/SBI/ICA/2020/TATR.2/IDN.

(Viet Nam), Koki Okawa (Japan), Emma Salisbury (member of the Consultative Group of Experts from the United Kingdom of Great Britain and Northern Ireland), Hansrajie Sukhdeo (Guyana) and Janka Szemesova (member of the Consultative Group of Experts from Slovakia). Paulo Cornejo and Naoki Matsuo were the co-leads. The technical analysis was coordinated by Anna Sikharulidze and Roman Payo (secretariat).

10. During the technical analysis, in addition to the written exchange, in the virtual team room, to provide technical clarifications on the information reported in the BUR, the TTE and Indonesia engaged in consultation[3] on the identification of capacity-building needs for the preparation of BURs and participation in the ICA process. Following the technical analysis of Indonesia's third BUR, the TTE prepared and shared a draft summary report with Indonesia on 9 August 2022 for its review and comment. Indonesia, in turn, provided its feedback on the draft summary report on 8 November 2022.

11. The TTE responded to and incorporated Indonesia's comments referred to in paragraph 10 above and finalized the summary report in consultation with the Party on 30 December 2022.

II. Technical analysis of the biennial update report

A. Scope of the technical analysis

12. The scope of the technical analysis is outlined in decision 20/CP.19, annex, paragraph 15, according to which the technical analysis aims to, without engaging in a discussion on the appropriateness of the actions, increase the transparency of mitigation actions and their effects and shall entail the following:

(a) The identification of the extent to which the elements of information listed in paragraph 3(a) of the ICA modalities and guidelines (decision 2/CP.17, annex IV) have been included in the BUR of the Party concerned (see chap. II.B below);

(b) A technical analysis of the information reported in the BUR, specified in the UNFCCC reporting guidelines on BURs (decision 2/CP.17, annex III), and any additional technical information provided by the Party concerned (see chap. II.C below);

(c) The identification, in consultation with the Party concerned, of capacity-building needs related to the facilitation of reporting in accordance with the UNFCCC reporting guidelines on BURs and to participation in ICA in accordance with the ICA modalities and guidelines, taking into account Article 4, paragraph 3, of the Convention (see chap. II.D below).

13. The remainder of this chapter presents the results of each of the three parts of the technical analysis of Indonesia's BUR outlined in paragraph 12 above.

B. Extent of the information reported

14. The elements of information referred to in paragraph 12(a) above include the national GHG inventory report; information on mitigation actions, including a description of such actions, an analysis of their impacts and the associated methodologies and assumptions, and information on progress in their implementation; information on domestic MRV; and information on support needed and received.

15. According to decision 20/CP.19, annex, paragraph 15(a), in undertaking the technical analysis of the submitted BUR, the TTE is to identify the extent to which the elements of information listed in paragraph 14 above have been included in the BUR of the Party concerned. The TTE considers that the reported information is mostly consistent with the UNFCCC reporting guidelines on BURs. Specific details on the extent of the information reported for each of the required elements are provided in the tables included in annex I.

[3] The consultation was conducted via videoconferencing.

16. The current TTE noted improvements in the reporting in Indonesia's third BUR compared with that in its previous BUR. Information on the GHG inventory and mitigation actions and their effects reported in the Party's third BUR demonstrates that it has taken into consideration the areas for enhancing the transparency of the extent of the information reported noted by the previous TTE in the summary report on the technical analysis of the Party's previous BUR.

C. Technical analysis of the information reported

17. The technical analysis referred to in paragraph 12(b) above aims to increase the transparency of information reported by the Parties on mitigation actions and their effects, without engaging in a discussion on the appropriateness of those actions. Accordingly, the focus of the technical analysis was on the transparency of the information reported in the BUR.

18. For information reported on national GHG inventories, the technical analysis also focused on the consistency of the methods used for preparing those inventories with the appropriate methods developed by the IPCC and referred to in the UNFCCC reporting guidelines on BURs.

19. The results of the technical analysis are presented in the remainder of this chapter.

1. Information on national circumstances and institutional arrangements relevant to the preparation of national communications on a continuous basis

20. As per the scope defined in paragraph 2 of the UNFCCC reporting guidelines on BURs, the BUR should provide an update to the information contained in the most recently submitted NC, including information on national circumstances and institutional arrangements relevant to the preparation of NCs on a continuous basis. In their NCs, non-Annex I Parties report on their national circumstances following the reporting guidance contained in decision 17/CP.8, annex, paragraphs 3–5, and they could report similar information in their BUR, which is an update of their most recently submitted NC.

21. In its third BUR, Indonesia provided an update on its national circumstances, including a description of features of geography, climate, population, economy and social development that might affect the Party's ability to deal with mitigating and adapting to climate change. Indonesia highlighted that, as the fourth largest country in the world by population, it expects to experience the impacts arising from the pandemic over a longer period than other countries. The pandemic has affected not only health, but also the economy and other aspects and functions of society. Some sectors have seen significant declines in productivity, including agriculture, forestry, fisheries, industry, trade and transportation.

22. In addition, Indonesia provided a summary of relevant information regarding its national circumstances in tabular and graphical format.

23. Indonesia transparently reported in its third BUR information on its existing institutional arrangements relevant to the preparation of its NCs and BURs on a continuous basis. The description covers key aspects of the institutional arrangements, including the legal status and roles and responsibilities of the overall coordinating entity for BUR development. Presidential regulation 16/2016 mandates the Directorate General of Climate Change under the Ministry of Environment and Forestry to oversee climate change governance and implementation of the Convention at the national level. The Party reported that the entire process of development of the third BUR, from preparation to submission, was coordinated by the Directorate and four working groups comprising representatives of relevant ministries and institutions. The BUR was prepared through the same institutional arrangements as those in place for NC development.

24. Indonesia reported in its third BUR an update on its domestic MRV arrangements. The description covers key aspects of the institutional arrangements, including the guidelines for implementing its MRV system, set out in ministerial regulation 72/2017 of the Ministry of Environment and Forestry. It regulates mechanisms for the MRV of the impact of climate actions and of financial, technology and capacity-building support received. The Party

reported on the process for validating and verifying the impacts of climate actions and the establishment of an NDC implementation secretariat to support this process; the creation of a panel of experts tasked with identifying, analysing and assessing the methodologies developed for measuring the emission reductions associated with proposed mitigation actions; and the implementation at the subnational and provincial level of a REDD+ registry system for the forestry sector, which has been active over the past three years.

2. National greenhouse gas emissions by sources and removals by sinks

25. As indicated in table I.1, Indonesia reported information on its GHG inventory in its BUR mostly in accordance with paragraphs 3–10 of the UNFCCC reporting guidelines on BURs and paragraphs 8–24 of the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties, contained in the annex to decision 17/CP.8.

26. Indonesia submitted its third BUR in 2021 and the GHG inventory reported is for 2019. The GHG inventory is consistent with the requirements for the reporting time frame.

27. GHG emissions and removals for the BUR covering the 2019 inventory were estimated using tier 1 and tier 2 methodologies from the 2006 IPCC Guidelines. A tier 1 methodology was used for the energy, AFOLU and waste sectors, whereas tier 1 and tier 2 methodologies were used for individual categories of the IPPU sector. The TTE commends Indonesia for using the 2006 IPCC Guidelines.

28. Information on the sources of AD and EFs used was clearly reported in the BUR. The sources of AD and designated coordinators for each sector are defined in ministerial decree 73/2017 and presented in BUR table 2-1.

29. Information on updated AD, such as fuel consumption for different categories, industrial production and livestock numbers, was not reported in the BUR. However, the Party provided relevant information in its BUR, describing the changes in AD that have occurred since its second BUR.

30. The methodology for estimating emissions from peat fires was not clearly reported. During the technical analysis, the Party clarified that the methodology for estimating emissions from peat fires used for the third BUR is the same as that used for the second BUR. The methodology, AD and EFs used for the second BUR are described in the 2016 REDD+ proposed forest reference emission level submission, while those for the third BUR are described in the 2022 REDD+ proposed forest reference level submission. In the latter submission, the methodology for estimating the AD for peatland is based on the estimation of peat decomposition. In contrast, the methodology for estimating burned area AD has changed: for the second BUR, burned area was based only on hotspot data, while for the third BUR, it was based on hotspot data supplemented by Landsat imagery.

31. Information on the Party's total GHG emissions by gas for 2019 is outlined in table 1 in Gg CO_2 eq. It shows an increase in net emissions, including emissions and removals from category 3.B (land), of 77.5 per cent since 2000 (1,039,617 Gg CO_2 eq).

Table 1
Greenhouse gas emissions by gas of Indonesia for 2019

Gas	*GHG emissions (Gg CO_2 eq) including land*[a]	*% change 2000–2019*	*GHG emissions (Gg CO_2 eq) excluding land*[a]	*% change 2000–2019*
CO_2	1 593 163	84.5	682 883	104.6
CH_4	185 191	43.9	185 191	43.9
N_2O	66 713	41.9	66 713	41.9
HFCs	NE	NA	NE	NA
PFCs	46	–83.1	46	–83.1
SF_6	NE	NA	NA	NA
Total	**1 845 113**	**77.5**	**934 833**	**83.4**

[a] 2006 IPCC Guidelines AFOLU category 3.B (land).

32. Indonesia reported in the BUR that emissions of HFCs and SF_6 occur in the country but were not estimated. However, the Party provided relevant clarification in its BUR, indicating that data and information on the sources and activity of these GHGs are still under preparation.

33. Information on other emissions was reported, including 66 Gg CO_2 eq NO_X and 2,436 Gg CO_2 eq CO from biomass burning under the agriculture sector.

34. Information on NMVOC emissions and on NO_X and CO emissions other than those from biomass burning was not reported in Indonesia's BUR. During the technical analysis, the Party clarified that these GHGs could not be estimated owing to a lack of data and limited capacity.

35. Indonesia applied notation keys in tables where numerical data were not provided. The use of notation keys was mostly consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties. However, notation keys were not used in some BUR tables; for example, in table 2-4, the cells for most precursor gases and F-gases were left blank, and in tables 2-5 and 29, emissions for some categories were reported as "-" or the corresponding cells were shaded. During the technical analysis, the Party clarified which notation keys should have been used for all cells where numerical data were not provided.

36. Indonesia reported comparable information addressing the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines. However, comparable information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF was not reported.

37. The shares of emissions that different sectors contributed to the Party's total GHG emissions excluding land and HWP (category 3.B and, if reported, 3.D), as calculated by the TTE using information from the BUR, in 2019 are reflected in table 2.

Table 2
Shares of greenhouse gas emissions by sector of Indonesia for 2019

Sector	*GHG emissions (Gg CO_2 eq)*	*% share*[a]	*% change 2000–2019*
Energy	636 453	68.1	100.4
IPPU	58 174	6.2	35.5
AFOLU	1 030 154	NA	67.0
Livestock (category 3.A)	26 977	2.9	30.1
Land (category 3.B)	910 280	NA	71.8
Aggregate sources and non-CO_2 emissions sources on land (category 3.C)	92 896	9.9	40.0
HWP and other emissions (category 3.D)	NE	NA	NA
Waste	120 333	12.9	93.5

[a] Share of total without 2006 IPCC Guidelines AFOLU category 3.B (land) and, if reported, 3.D (HWP (3.D.1) and other emissions (3.D.2)).

38. Indonesia reported information on its use of GWP values consistent with those provided by the IPCC in its AR2 based on the effects over a 100-year time-horizon of GHGs.

39. For the energy sector, information was clearly reported on GHG emissions, methodological tier levels, sources of AD and key categories. AD for the sector were sourced from the *Handbook of Energy & Economic Statistics of Indonesia 2021*, except for the AD on fuel consumption for manufacturing industries, which were collected at the plant level by the Ministry of Industry. The primary sources of sectoral GHG emissions were fuel combustion in electricity generation followed by transport and then manufacturing industries and construction.

40. Information on emissions for some subcategories of the energy sector, including non-ferrous metals and underground coal mining, was not clearly reported in Indonesia's BUR. During the technical analysis, the Party clarified that there are no underground coal mines in the country; therefore, emissions for this category should have been reported as "NO". For

the other omitted subcategories, the Party explained that constraints in data collection prevented the estimation of emissions.

41. For the IPPU sector, information was clearly reported on GHG emissions, methodological tier levels and key categories. Emissions from cement production and ammonia production were estimated using plant-specific EFs, which is an improvement compared with the second BUR, for which default EFs were mostly used. A tier 1 methodology was used for estimating emissions from other categories. Indonesia reported CF_4 emissions of 46 Gg CO_2 eq from aluminium production. The main sources of GHG emissions, in descending order, were cement production, ammonia production, iron and steel production, paraffin wax use, other uses of soda ash, ethylene production and nitric acid production.

42. Information on the category N_2O from product uses was not reported in Indonesia's BUR, and F-gas emissions, apart from those arising from aluminium production, were reported as "NE" or "NO" (BUR table 2-4). During the technical analysis, the Party clarified that emissions for these categories were not estimated owing to a lack of data and limited technical capacity.

43. For 2006 IPCC Guidelines AFOLU categories 3.A and 3.C, direct N_2O emissions from managed soils (3.C.4), rice cultivation (3.C.7) (CH_4) and enteric fermentation (3.A.1) (CH_4) were identified as the most relevant emissions sources in the sector, contributing 30.2, 24.0 and 17.0 per cent, respectively, to sectoral emissions. Indonesia used default EFs from the 2006 IPCC Guidelines for estimating emissions, except for enteric fermentation of cattle and buffalo, for which it applied country-specific EFs. The Party has updated, since the second BUR, its method for calculating harvested rice area.

44. For land and HWP (categories 3.B and 3.D), Indonesia reported annual GHG emissions and removals for 2000–2019 for category 3.B only, while emissions and removals for category 3.D were reported as "NE". Overall, the net removals from category 3.B fluctuated between a minimum of 616,897 Gg CO_2 eq in 2000 and a maximum of 924,853 Gg CO_2 eq in 2019.

45. Information on emissions from peat fires and peat decomposition was not clearly reported in Indonesia's BUR. These emissions were reported under the "non-IPCC" category together with emissions for category 3.B (land). However, BUR tables 1 and 2-2 report agriculture and FOLU as two separate sectors and it was not clear to the TTE whether emissions from peat fires and peat decomposition were reported under agriculture or under FOLU; BUR figure 2 shows emissions from peat fires separately from emissions from agriculture and FOLU; BUR table 2-4 shows emissions from peat fires and peat decomposition as two independent categories under AFOLU (i.e. under neither cropland nor biomass burning); and BUR table 2-15 shows CO_2 emissions from peat fires and peat decomposition as two "other" categories, while CH_4 and N_2O emissions are presumably accounted for under the category biomass burning. During the technical analysis, the Party clarified that peatland occurs in all land-use categories. In calculating emissions for each land-use category, emissions from soil organic carbon in peatland were not included, but they were instead calculated separately following the *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. Thus, these emissions were reported under the "other land" categories under category 3.B. The TTE noted that CO_2 emissions from peat fires and peat decomposition in deforested areas should be reported under cropland remaining cropland or land converted to cropland, as relevant, and the associated CH_4 and N_2O emissions should be reported under biomass burning.

46. For the waste sector, information was clearly reported on GHG emissions, methodological tier levels, sources of AD and key categories. Data on domestic wastewater treatment were sourced from People's Welfare Statistics of Statistics Indonesia, data on municipal solid waste management were sourced from the database of the 'ADIPURA' clean city programme and data on the quantity of landfill gas recovered were sourced from the Ministry of Environment and Forestry. The most significant emissions sources for the waste sector were industrial wastewater treatment and discharge, unmanaged municipal solid waste disposal sites and domestic wastewater treatment and discharge.

47. Information on CH_4 emissions from managed domestic waste disposal sites and anaerobic digestion at biogas facilities, as well as CO_2, CH_4 and N_2O emissions from waste incineration, was not clearly reported in Indonesia's BUR. The corresponding cells in BUR table 2-19 were shaded grey instead of containing an appropriate notation key. During the technical analysis, the Party clarified that (a) it considered all municipal solid waste disposal sites as unmanaged and all industrial solid waste disposal sites as managed and, as a result, no solid waste disposal site was considered as uncategorized; (b) there was no anaerobic digestion of municipal or industrial solid waste; (c) it could not estimate emissions from the incineration of medical or other waste. The Party indicated that, in BUR table 2-19, emissions from managed municipal solid waste, uncategorized waste disposal sites and anaerobic digestion at biogas facilities should have been reported as "NO", and emissions from waste incineration as "NE".

48. The BUR provides an update to some of the GHG inventories reported in the Party's previous NCs and BURs. The information reported provides an update of the Party's second BUR, which addresses anthropogenic emissions and removals for 2016. The update was carried out for 2000–2019 using the methodologies contained in the 2006 IPCC Guidelines, thus generating a consistent 20-year time series. The Party provided in the BUR detailed descriptions of all the recalculations for each sector and the reasons for them. The recalculations resulted from improvements to the GHG inventory, such as the use of higher-tier methodologies, improved AD and EFs and the addition of a new source category.

49. Information on a consistent time series back to 1990–1994, as reported in the Party's INC, was not reported in Indonesia's BUR. During the technical analysis, the Party clarified that these years were not included in the time series reported in the BUR because improvements in AD and their sources made since the submission of the INC were not available for those years, resulting in inconsistent time series.

50. Indonesia described in its BUR the institutional framework for the preparation of its 2019 GHG inventory. The Party reported that the Ministry of Environment and Forestry is the governmental body responsible for its climate change policy and GHG inventory, which was prepared with the support of GIZ and funding from the Government of Indonesia and other donors. The institutional arrangements for developing national GHG inventories are underpinned by the Director of GHG Inventory and MRV, part of the Ministry of Environment and Forestry, which coordinates both the process and the other ministries, agencies and research institutes involved, such as the Ministry of Agriculture, Ministry of Energy and Mineral Resources, Ministry of Industry, Ministry of Public Works and Housing, Ministry of Transportation, Statistics Indonesia, the Geospatial Information Agency and the National Institute of Aeronautics and Space. The Party identified improvements in the information reported, such as the improvements arising from the fact that sectoral entities now calculate emission estimates in addition to collecting data. Further, Indonesia reported that ministerial decree 73/2017 regulates the institutional arrangements for developing the national GHG inventory, including the roles and responsibilities of sectoral entities.

51. Information on GHG inventory management, archiving and QA/QC was not clearly reported in Indonesia's BUR. While sectoral entities are responsible for QA/QC under ministerial decree 73/2017, the Party reported that, for the time being, they only provide data and calculate emission estimates.

52. Indonesia clearly reported that a key category analysis was performed for the level of emissions with and without FOLU (including peat fires). Separate key category analyses were also performed for the level of emissions for each of the energy, IPPU, agriculture, FOLU and waste sectors. None of the key category analyses was carried out on a gas-by-gas basis – they were all based on estimates in CO_2 eq. During the technical analysis, the Party indicated that segregation by gas will be carried out for future BURs.

53. Indonesia clearly reported information on CO_2 fuel combustion emissions using both the sectoral and the reference approach. The information reported indicates that the combustion emissions estimated under the sectoral and reference approach are 636,453 and 643,129 Gg CO_2 eq, respectively, for 2019. The difference between the estimates calculated using the two approaches over 2000–2019 ranged from –5.0 to +8.5 per cent, with the

emissions calculated by the reference approach exceeding those calculated by the sectoral approach for most years.

54. Information on international aviation and marine bunker fuels was not reported in Indonesia's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that disaggregated data are not available for international bunker fuels and therefore these emissions are aggregated with those from domestic activities.

55. Indonesia reported information on the uncertainty assessment (level) of its national GHG inventory. The uncertainty analysis covers all source categories and all direct GHGs. The results obtained, as reported in the BUR, reveal that the level uncertainty for emissions is 19.9 per cent with FOLU (including peat fires) and 13.8 per cent without FOLU (including peat fires).

56. Information on the methodological approach and underlying assumptions for the uncertainty assessment was not clearly reported in Indonesia's BUR. During the technical analysis, the Party clarified that there were challenges in identifying the sources of uncertainty and estimating the uncertainty levels in the AD and therefore assumptions of uncertainty of the AD and EFs used were mostly based on expert judgment.

57. The TTE noted that the transparency of the information reported on GHG inventories could be enhanced by addressing the areas noted in paragraphs 29, 34, 35, 40, 42, 47, 49, 51, 54 and 56 above, which could facilitate a better understanding of the information reported on GHG inventories.

58. In paragraphs 27 and 32 of the summary report on the technical analysis of Indonesia's second BUR, the previous TTE noted areas where the transparency of the reporting on GHG inventories, specifically regarding F-gas emissions and GWP values, could be further enhanced. The current TTE noted the improvements referred to in paragraphs 33 and 38 above and commends the Party for enhancing the transparency of its reporting.

3. Mitigation actions and their effects, including associated methodologies and assumptions

59. As indicated in table I.2, Indonesia reported in its BUR, mostly in accordance with paragraphs 11–13 of the UNFCCC reporting guidelines on BURs, information on mitigation actions and their effects, to the extent possible.

60. The information reported provides a clear and comprehensive overview of the Party's mitigation actions and their effects. In its BUR, Indonesia reported information on its national context and framed its national mitigation planning and actions in the context of its NDC. The Government of Indonesia submitted its NDC in 2016, in which it pledged to reduce emissions by 29 per cent (unconditional target) to 41 per cent (conditional target) by 2030 compared with the 'business as usual' scenario. The Party submitted an updated NDC in 2021; while the mitigation target was the same, the achievement of mitigation actions was evaluated against the projected 'business as usual' scenario for both the unconditional and conditional emission reduction scenarios, all of which have a base year of 2010. Indonesia reported that climate change has been mainstreamed in and integrated into its national policies, including mitigation.

61. Most of the mitigation actions are in the energy sector. The mitigation actions in the energy and FOLU sectors are the most significant. Further, the implemented mitigation actions contributed to estimated emission reductions of 721,000 Gg CO_2 eq from 2017 to 2019 (a 13 per cent reduction compared with the projected 'business as usual' scenario), with the energy sector being the main source of emission reductions (contributing 66 per cent of the total reduction compared with the projected 'business as usual' scenario). The overall trend in emission reductions is determined by the increasing mitigation contribution of the energy sector, while year-to-year variation is determined by the contribution of the FOLU sector, particularly of peat fires. The information reported includes a clear assessment of top-down and bottom-up calculations of the impacts of mitigation actions, with identification and discussion of the gaps between the estimated reductions and historical GHG inventory estimates. The sector-specific mitigation reductions reported in the BUR are based on a top-down analysis.

62. The Party reported a summary of its sectoral mitigation actions in tabular format in accordance with decision 2/CP.17, annex III, paragraph 11. The Party also reported information on its mitigation actions in narrative format.

63. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Indonesia clearly reported the names of mitigation actions or groups of actions, coverage (sector and gases), nature of the mitigation actions and progress indicators in the BUR (appendices 1–6). A clear description of mitigation actions, as well as information on quantitative goals, was provided in the BUR.

64. Information on progress indicators was not clearly reported in Indonesia's BUR. During the technical analysis, the Party clarified that while this information was not provided in the third BUR, progress indicators are described in detail in Indonesia's NDC road map, so they can be included in future reports.

65. Indonesia clearly reported information on methodologies and assumptions, the objectives of the actions and steps taken or envisaged to achieve those actions, progress of implementation of actions and underlying steps taken or envisaged to achieve them, and results achieved (estimates), including results that have been verified, for most mitigation actions in the energy (including transport), IPPU, agriculture, FOLU and waste sectors.

66. The mitigation actions in the energy sector (including the transport subsector) focus mainly on improving energy efficiency, promoting renewable energy sources, switching to the use of lower carbon fuels, improving public transport infrastructure and shifting road transport journeys to the railway system, and were reported as implemented, ongoing or planned. The Government of Indonesia has issued several regulations to support mitigation actions in the sector. One of them, relating to the national energy policy (79/2014), sets clear targets for the primary energy supply mix, supporting climate change mitigation by increasing the use of renewable energy sources and decreasing the use of fossil fuels. The Party reported the results of implementing its mitigation actions, as emission reductions. The reduction in GHG emissions for four categories of actions with comparable contributions (implementing clean coal technology, improving gas distribution lines and increasing the use of renewable energy sources on the supply side, and promoting energy efficiency) was estimated to be 129,844, 157,337 and 186,932 Gg CO_2 eq compared with baseline emissions for 2017, 2018 and 2019, respectively. Transportation mitigation actions have a smaller contribution, dominated by the action to shift road transport journeys to the railway system.

67. The mitigation actions in the IPPU sector focus mainly on increasing the efficiency of materials use and of processes, and were reported as implemented or ongoing. The Ministry of Industry has developed several policy instruments to support and facilitate mitigation actions in various industries, for example, encouraging the use of materials. The Party reported the results of implementing its mitigation actions, as emission reductions. The reduction in GHG emissions by the sector was estimated to be 2,866, 4,755 and 5,708 Gg CO_2 eq compared with baseline emissions for 2017, 2018 and 2019, respectively. This reduction is driven by actions relating to the cement industry (via the implementation of blended cement technology) followed by those relating to the ammonia fertilizer industry.

68. The mitigation actions in the agriculture sector focus on increasing crop productivity and optimizing the use of livestock manure as fertilizer, and were reported as ongoing. The introduction of an improved plant cultivation technology as part of an action relating to low-emission crop varieties covered an area of 5,874,524 ha in 2017 and 6,484,122 ha in 2019. The Party reported the results of implementing its mitigation actions, as emission reductions. The sector's reduction in GHG emissions was estimated to be 10,000, 11,000 and 11,000 Gg CO_2 eq compared with baseline emissions for 2017, 2018 and 2019, respectively.

69. The mitigation actions in the FOLU sector focus mainly on reducing deforestation and the occurrence of peat fires, and were reported as ongoing. Indonesia has established 531 forest management units covering a total area of about 84 million ha under one of its key policies to improve the management of land and forest resources. The Party reported the results of implementing its mitigation actions, as emission reductions. The sector's reduction in GHG emissions was estimated to be 278,000 and 42,000 Gg CO_2 eq compared with baseline emissions for 2017 and 2018, respectively. For 2019, an increase in emissions of 160,000 Gg CO_2 eq was observed. This increase was attributable to an extreme drought

caused by an El Niño/Southern Oscillation event, which was responsible for large fires throughout the country in that year.

70. The mitigation actions in the waste sector focus mainly on implementing landfill gas recovery and improving wastewater management practices, and were reported as implemented or ongoing. Indonesia committed to further reducing emissions from waste management by 2020 and beyond by developing a comprehensive, coherent policy for waste management, strengthening institutions, improving financial mechanisms, promoting technological innovation and applying sociocultural approaches. Landfill gas recovery has been successfully implemented at four landfill sites. The Party reported the results of implementing its mitigation actions, as emission reductions. The sector's reduction in GHG emissions was estimated to be 14,666, 15,764 and 17,503 Gg CO_2 eq compared with baseline emissions for 2017, 2018 and 2019, respectively. The reduction is primarily due to the mitigation of GHG emissions from industrial waste treatment, which is dominated by the change in treatment of empty fruit bunches in crude palm oil mills.

71. Information on steps taken or envisaged to achieve the action for some energy sector mitigation actions was not clearly reported in Indonesia's BUR. During the technical analysis, the Party clarified that while this information was not provided in the third BUR, steps taken or envisaged are described in detail in Indonesia's NDC road map, so they can be included in future reports.

72. Indonesia provided information on its involvement in international market mechanisms as a Party to the Kyoto Protocol. Indonesia documented 118 verified clean development mechanism projects under the UNFCCC clean development mechanism process. The statistics include information on the total projects, sectors covered and quantity of certified emission reductions issued for Indonesia.

73. Indonesia reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that Indonesia has in place a domestic MRV system for mitigation actions. Indonesia reported that following its ratification of the Paris Agreement and submission of its first NDC, its mitigation action plan is being prepared by relevant ministries. The Ministry of Environment and Forestry coordinates development of the action plan and is responsible for ensuring that it is integrated into sectoral plans and programmes. Implementation, monitoring and reporting of mitigation actions is undertaken by relevant ministries and reports thereon are submitted to the Ministry of Environment and Forestry for verification. They are subsequently recorded in the National Registry System for Climate Change managed by that Ministry.

74. The TTE noted that the transparency of the information reported on mitigation actions could be further enhanced by addressing the areas noted in paragraphs 64 and 71 above, which could facilitate a better understanding of the information reported on mitigation actions.

75. In paragraphs 51, 52 and 54 of the summary report on the technical analysis of Indonesia's second BUR, the previous TTE noted areas where the transparency of the reporting on mitigation actions, specifically regarding gases involved and methodologies and assumptions used, could be further enhanced. The current TTE noted the improvements referred to in paragraphs 63 and 65 above and commends the Party for enhancing the transparency of its reporting.

4. Constraints and gaps, and related technology, financial, technical and capacity-building needs, including a description of support needed and received

76. As indicated in table I.3, Indonesia reported in its BUR, mostly in accordance with paragraphs 14–16 of the UNFCCC reporting guidelines on BURs, information on finance, technology and capacity-building needs and support received.

77. Indonesia reported information on constraints and gaps, and related financial, technical and capacity-building needs in accordance with decision 2/CP.17, annex III, paragraph 14. In its BUR, Indonesia recognized that effective implementation of mitigation and adaptation actions requires the continuous building of capacity of sectoral ministries, the

private sector and communities. Indonesia reported that its technical and capacity-building needs are primarily in the areas of implementing, tracking the progress of and measuring results for its mitigation actions and preparing its GHG inventory, including integrating current national data-collection systems (BUR chap. 5.1.3).

78. Indonesia reported information on financial resources, technology transfer, capacity-building and technical support received in accordance with decision 2/CP.17, annex III, paragraph 15. In its BUR, Indonesia reported that it received USD 34,554 from GIZ for drafting its third BUR and USD 12,407 from the Global Green Growth Institute for finalizing it, but it did not receive any financial resources from the Global Environment Facility for preparing its third BUR. In 2017–2019, Indonesia received USD 16.15 million from various countries and development agencies, mostly in the form of grants for mitigation actions in the FOLU sector and for multisectoral projects; for example, it received financial support from the Government of the Netherlands to establish institutional arrangements at the national level.

79. Information on some of the financial support received was not reported in Indonesia's BUR. However, the Party provided relevant clarification during the technical analysis, indicating that data limitations and the lack of a system for tracking financial support received by different sectors prevented it from being able to report fully in this regard.

80. Information on technology needs with regard to the development and transfer of technology was not reported clearly in Indonesia's BUR. While the Party reported technology needs, it did not state whether these were nationally determined, in accordance with decision 2/CP.17, annex III, paragraph 16. In addition, Indonesia indicated that some technology support received was not reported owing to data limitations. During the technical analysis, the Party clarified the approaches, including stakeholder consultation, it applied to determine technology needs for the energy, IPPU and waste sectors. The Party also clarified that most of the technology support it received was classified as environmental support; only a few instances of support provision were identified as being specifically for climate change. Indonesia informed the TTE that a system for tracking data on technology support received for climate change is needed to address this constraint.

81. The TTE noted that the transparency of the information reported on needs and support received could be further enhanced by addressing the areas noted in paragraphs 79–80 above, which could facilitate a better understanding of the information reported on needs and support received.

D. Identification of capacity-building needs

82. In consultation with Indonesia, the TTE identified the following needs for capacity-building that could facilitate the preparation of subsequent BURs and participation in ICA:

(a) With respect to the GHG inventory:

(i) Enhancing technical knowledge and capability for developing country-specific EFs for CH_4 and N_2O for key categories in the energy sector;

(ii) Enhancing capacity to collect data, develop EFs and estimate emissions for precursor gases;

(iii) Enhancing capacity to collect data for and estimate and report emissions from international bunker fuels;

(iv) Enhancing capacity to identify the sources of uncertainty and estimate the uncertainty level of AD for all sectors;

(v) Enhancing capacity to carry out QA/QC for and manage and archive inventory data;

(vi) Developing capacity to collect and report data in order to improve the completeness of the GHG inventory, and to implement QA/QC of reports in order to improve the transparency of reporting;

(b) With respect to mitigation actions:

(i) Improving national capacity to engage a wide range of stakeholders in reporting on implementation, progress and results of mitigation actions;

(ii) Enhancing technical knowledge for linking mitigation actions with GHG inventories;

(iii) Improving the capacity of sectoral ministries, local governments and the private sector to incorporate climate actions into long-term plans and programmes by setting quantitative mitigation goals that contribute to meeting overarching national goals;

(c) With respect to cross-cutting issues, strengthening institutional capacity by developing an effective institutional system that links processes related to mitigation sectors with the GHG inventory in order to collect data for and coordinate BUR preparation and submission such that the process occurs in a timely manner;

(d) With respect to needs and support:

(i) Enhancing national capacity to conduct nationally determined technology needs assessments for key source sectors;

(ii) Enhancing institutional capacity to overcome data limitation constraints and gaps when collecting information on technology support received by developing a system to identify, track and record technology support received for climate change;

(iii) Enhancing capacity to develop a system for tracking financial support received by different sectors.

83. The TTE noted that, in addition to those identified during the technical analysis, Indonesia reported several capacity-building needs in its BUR (chap. 5.1.3), covering the following areas:

(a) Data-collection capacity and knowledge, including for developing templates;

(b) Development of an information system or an integrated web-based system for collecting data for GHG inventories and on mitigation actions at the national and local level;

(c) Technical capability of governments and non-government agencies to integrate MRV into long-term plans and programmes;

(d) Accessibility of education and learning materials on climate change;

(e) Accessibility of climate finance information, including drafts of funding proposals and project plans, by governments, particularly local governments;

(f) Budget tagging and climate finance tracking to identify and monitor support received;

(g) Institutional arrangements for continuous data exchange among and within ministries and agencies.

III. Conclusions

84. The TTE conducted a technical analysis of the information reported in the third BUR of Indonesia in accordance with the UNFCCC reporting guidelines on BURs and concludes that the information reported is mostly consistent. It provides an overview of national circumstances and institutional arrangements relevant to the preparation of NCs on a continuous basis; the national inventory of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol, including a national inventory report; mitigation actions and their effects, including associated methodologies and assumptions; constraints and gaps, and related financial, technical and capacity-building needs, including a description of support needed and received; the level of support received to enable the preparation and submission of BURs; and domestic MRV. During the technical analysis, additional information

was provided by Indonesia on the GHG inventory, mitigation actions, and needs and support received. The TTE concluded that the information analysed is mostly transparent.

85. Indonesia reported information on the institutional arrangements relevant to the preparation of its BURs. The reported information, including tables and figures, outlines the key aspects of the institutional arrangements that enable sustainable preparation of its BURs, such as relevant regulations, coordinating institutions, and ministries and other agencies involved. The Party has taken significant steps to establish institutional arrangements for its domestic MRV system by formulating regulations and making organizational improvements to facilitate implementation of the system. Indonesia provided an update on the process for validating and verifying the impacts of climate actions, the workflow of the National Registry System for Climate Change, the role of the methodology panel and the implementation of the REDD+ registry system.

86. In its third BUR, submitted in 2021, Indonesia reported information on its national GHG inventory for 2019. This included GHG emissions and removals of CO_2, CH_4, N_2O and PFCs for most relevant sources and sinks as well as the precursor gases for biomass burning under the agriculture sector. The inventory was developed on the basis of the 2006 IPCC Guidelines. The total GHG emissions for 2019 were reported as 934,833 Gg CO_2 eq (excluding category 3.B land) and 1,845,113 Gg CO_2 eq (including land). Seventeen key categories were identified with FOLU (including peat fires) and 16 key categories and main gases were identified without FOLU (including peat fires). Estimates of F-gases other than CF_4 and hexafluoroethane were not provided owing to the unavailability of the necessary data, as clarified by the Party in the BUR.

87. Indonesia reported information on mitigation actions and their effects in both tabular and narrative format, including its NDC target to reduce GHG emissions by 29 per cent (unconditional target) to 41 per cent (conditional target) compared with 'business as usual' emissions by 2030. Indonesia reported planned, implemented and ongoing actions in the energy (including transport), agriculture, FOLU and waste sectors. The mitigation actions focus on reducing deforestation, improving energy efficiency, increasing the use of renewable energy sources and improving gas distribution lines. The Party reported the progress of implementation of its mitigation actions and the results achieved, including emission reductions. The highest emission reduction was reported for the energy sector of 474,113 Gg CO_2 eq between 2017 and 2019. The Party also reported information on its involvement in international market mechanisms and on MRV arrangements. Information on progress indicators and steps taken or envisaged to achieve the action was not provided for all mitigation actions owing to the information being available in other documents, as clarified by the Party during the technical analysis.

88. Indonesia reported information on key constraints, gaps and related needs, including the need for continuous capacity-building of sectoral ministries, the private sector and communities to effectively implement mitigation and adaptation actions. Information was reported on the financial resources, technology transfer and capacity-building support received for mitigation actions. The Party also reported that it received financial support of USD 34,554 from GIZ and USD 12,407 from the Global Green Growth Institute for preparing its third BUR. Some information on financial and technology support received was not reported owing to the unavailability of a system for tracking the necessary data, as clarified by the Party during the technical analysis.

89. The current TTE noted improvements in the reporting in the Party's third BUR compared with that in its second BUR. The information reported demonstrates that the Party has taken into consideration the areas for enhancing the transparency of the information reported noted by the TTE in the summary report on the technical analysis of the second BUR. However, improvements are ongoing, and the Party has taken note of outstanding areas for future improvements.

90. The TTE, in consultation with Indonesia, identified the 13 capacity-building needs listed in chapter II.D above and needs for capacity-building that aim to facilitate reporting in accordance with the UNFCCC reporting guidelines on BURs and participation in ICA in accordance with the ICA modalities and guidelines, taking into account Article 4, paragraph 3, of the Convention. Indonesia prioritized all the capacity-building needs referred to in paragraph 82 above.

Annex I

Extent of the information reported by Indonesia in its third biennial update report

Table I.1
Identification of the extent to which the elements of information on greenhouse gases are included in the third biennial update report of Indonesia

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, paragraph 41(g)	The first BUR shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available, and subsequent BURs shall cover a calendar year that does not precede the submission date by more than four years.	Yes	Indonesia submitted its third BUR in December 2021; the GHG inventory reported is for 2019.
Decision 2/CP.17, annex III, paragraph 4	Non-Annex I Parties should use the methodologies established in the latest UNFCCC guidelines for the preparation of NCs from non-Annex I Parties approved by the Conference of the Parties or those determined by any future decision of the Conference of the Parties on this matter.	Yes	Indonesia used the 2006 IPCC Guidelines.
Decision 2/CP.17, annex III, paragraph 5	The updates of the section on national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol should contain updated data on activity levels based on the best information available using the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF; any change to the EF may be made in the subsequent full NC.	No	
Decision 2/CP.17, annex III, paragraph 6	Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the BUR:		
	(a) The tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF;	No	
	(b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines.	Yes	Comparable information was reported.
Decision 2/CP.17, annex III, paragraph 7	Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in its previous NCs.	Partly	Indonesia reported a consistent time series back to 2000 in accordance with its INC; however, the time series reported in the BUR does not include 1990–1994, in contrast to the INC.
Decision 2/CP.17, annex III, paragraph 8	Non-Annex I Parties that have previously reported on their national GHG inventories contained in their NCs are encouraged to submit summary information tables of inventories for previous submission years (e.g. for 1994 and 2000).	Partly	This information was reported for 2000 and 2019 but does not include summary information of previous inventory years reported in the INC (1990–1994).

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 9	The inventory section of the BUR should consist of a national inventory report as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National greenhouse gas inventories), including:		
	(a) Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors);	Yes	Comparable information was reported in BUR table 2-4.
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6).	Yes	Comparable information was reported in BUR table 2-4.
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex.	Yes	Indonesia submitted a REDD+ technical annex to its third BUR.
Decision 17/CP.8, annex, paragraph 12	Non-Annex I Parties are also encouraged, to the extent possible, to undertake any key source analysis as indicated in the IPCC good practice guidance to assist in developing inventories that better reflect their national circumstances.	Yes	
Decision 17/CP.8, annex, paragraph 13	Non-Annex I Parties are encouraged to describe procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories, as well as efforts to make this a continuous process, including information on the role of the institutions involved.	Partly	Information on the procedures and institutional arrangements for data archiving was not reported.
Decision 17/CP.8, annex, paragraph 14	Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of:		
	(a) CO_2;	Partly	Emissions for some subcategories were not estimated (ferroalloys production and magnesium production).
	(b) CH_4;	Partly	Emissions for some subcategories were not estimated (ferroalloys production and underground coal mining). Emissions for the waste sector were reported in CO_2 eq only.
	(c) N_2O.	Partly	Emissions for the subcategory N_2O from product uses (IPPU sector) were not estimated. Emissions for the waste sector were reported in CO_2 eq but not in units of mass.
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:		

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	(a) HFCs;	Partly	HFC emissions were reported as "NE" or "NO" for most categories; however, not all categories were covered in the reporting.
	(b) PFCs;	Partly	The Party estimated and reported PFC emissions from aluminium production. For most other categories PFC emissions were reported as "NE" or "NO"; however, not all categories were covered in the reporting.
	(c) SF_6.	Partly	SF_6 emissions were reported as "NE" or "NO" for most categories; however, not all categories were covered in the reporting.
Decision 17/CP.8, annex, paragraph 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emissions by sources of other GHGs, such as:		
	(a) CO;	Yes	Emissions were reported as "NE" in BUR summary table 1 and emissions by category were not reported in BUR table 2-4 except for those from biomass burning.
	(b) NO_X;	Yes	Emissions were reported as "NE" in BUR summary table 1 and emissions by category were not reported in BUR table 2-4 except for those from biomass burning.
	(c) NMVOCs.	Yes	Emissions were reported as "NE" or "NO" in BUR summary table 1 and emissions by category were not reported in BUR table 2-4.
Decision 17/CP.8, annex, paragraph 17	Other gases not controlled by the Montreal Protocol, such as sulfur oxides, and included in the Revised 1996 IPCC Guidelines may be included at the discretion of Parties.	Yes	Indonesia reported emissions of other gases, such as sulfur oxides, as "NE" or "NO".
Decision 17/CP.8, annex, paragraph 18	Non-Annex I Parties are encouraged, to the extent possible, and if disaggregated data are available, to estimate and report CO_2 fuel combustion emissions using both the sectoral and the reference approach and to explain any large differences between the two approaches.	Yes	
Decision 17/CP.8, annex, paragraph 19	Non-Annex I Parties should, to the extent possible, and if disaggregated data are available, report emissions from international aviation and marine bunker fuels separately in their inventories:		
	(a) International aviation;	No	
	(b) Marine bunker fuels.	No	

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 17/CP.8, annex, paragraph 20	Non-Annex I Parties wishing to report on aggregated GHG emissions and removals expressed in CO_2 eq should use the GWP provided by the IPCC in its AR2 based on the effects of GHGs over a 100-year time-horizon.	Yes	Indonesia used the GWP values provided in the AR2.
Decision 17/CP.8, annex, paragraph 21	Non-Annex I Parties are encouraged to provide information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol, including a brief explanation of the sources of EFs and AD. If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe the source and/or sink categories, methodologies, EFs and AD used in their estimation of emissions, as appropriate. Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building:		
	(a) Information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol;	Yes	
	(b) Explanation of the sources of EFs;	Yes	
	(c) Explanation of the sources of AD;	Yes	
	(d) If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe:	Yes	Indonesia used the 2006 IPCC Guidelines. Emissions from peat decomposition and peat fires were reported under the AFOLU sector.
	(i) Source and/or sink categories;		
	(ii) Methodologies;		
	(iii) EFs;		
	(iv) AD;		
	(e) Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building.	Yes	
Decision 17/CP.8, annex, paragraph 22	Each non-Annex I Party is encouraged to use tables 1–2 of the guidelines annexed to decision 17/CP.8 in reporting its national GHG inventory, taking into account the provisions established in paragraphs 14–17. In preparing those tables, Parties should strive to present information that is as complete as possible. Where numerical data are not provided, Parties should use the notation keys as indicated.	Partly	Notation keys were used; however, some table cells were left blank, shaded or filled with "-".
Decision 17/CP.8, annex, paragraph 24	Non-Annex I Parties are encouraged to provide information on the level of uncertainty associated with inventory data and their underlying assumptions, and to describe the methodologies used, if any, for estimating these uncertainties:		

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	(a) Level of uncertainty associated with inventory data;	Yes	
	(b) Underlying assumptions;	No	
	(c) Methodologies used, if any, for estimating these uncertainties.	No	

Note: The parts of the UNFCCC reporting guidelines on BURs on reporting information on GHG emissions by sources and removals by sinks in BURs are contained in decision 2/CP.17, paras. 3–10 and 41(g). Further, as per para. 3 of those guidelines, non-Annex I Parties are to submit updates of their national GHG inventories in accordance with paras. 8–24 of the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties, contained in the annex to decision 17/CP.8. The scope of such updates should be consistent with the non-Annex I Party's capacity and time constraints and the availability of its data, as well as the level of support provided by developed country Parties for biennial update reporting.

Table I.2
Identification of the extent to which the elements of information on mitigation actions are included in the third biennial update report of Indonesia

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 11	Non-Annex I Parties should provide information, in tabular format, on actions to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol.	Yes	The Party included information in tabular format.
Decision 2/CP.17, annex III, paragraph 12	For each mitigation action or group of mitigation actions, including, as appropriate, those listed in document FCCC/AWGLCA/2011/INF.1, developing country Parties shall provide the following information, to the extent possible:		
	(a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indicators;	Partly	Information on progress indicators was not reported for the mitigation actions in the energy, IPPU and waste sectors.
	(b) Information on:		
	(i) Methodologies;	Yes	
	(ii) Assumptions;	Yes	
	(c) Information on:		
	(i) Objectives of the action;	Yes	
	(ii) Steps taken or envisaged to achieve that action;	Partly	Information on steps taken or envisaged to achieve the action was not reported for some of the mitigation actions in the energy sector.
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Yes	
	(ii) Progress of implementation of the underlying steps taken or envisaged;	Yes	

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Yes	
	(e) Information on international market mechanisms.	Yes	
Decision 2/CP.17, annex III, paragraph 13	Parties should provide information on domestic MRV arrangements.	Yes	

Note: The parts of the UNFCCC reporting guidelines on BURs on the reporting of information on mitigation actions in BURs are contained in decision 2/CP.17, annex III, paras. 11–13.

Table I.3
Identification of the extent to which the elements of information on finance, technology and capacity-building needs and support received are included in the third biennial update report of Indonesia

Decision	*Provision of the reporting requirements*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on:		
	(a) Constraints and gaps;	Yes	
	(b) Related financial, technical and capacity-building needs.	Yes	
Decision 2/CP.17, annex III, paragraph 15	Non-Annex I Parties should provide:		
	(a) Information on financial resources received, technology transfer and capacity-building received;	Yes	
	(b) Information on technical support received from the Global Environment Facility, Parties included in Annex II to the Convention and other developed country Parties, the Green Climate Fund and multilateral institutions for activities relating to climate change, including for the preparation of the current BUR.	Yes	
Decision 2/CP.17, annex III, paragraph 16	With regard to the development and transfer of technology, non-Annex I Parties should provide information on:		
	(a) Nationally determined technology needs;	Partly	A description of technology needs was reported; however, the Party did not state whether the needs were nationally determined.
	(b) Technology support received.	Yes	

Note: The parts of the UNFCCC reporting guidelines on BURs on the reporting of information on finance, technology and capacity-building needs and support received in BURs are contained in decision 2/CP.17, annex III, paras. 14–16.

Annex II

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

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B. UNFCCC documents

NC3 of Indonesia. Available at https://unfccc.int/non-annex-I-NCs.

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C. Other documents

The following reference may not conform to UNFCCC editorial style as it has been reproduced as received:

Ministry of Energy and Mineral Resources, Indonesia. 2021. *Handbook of Energy & Economic Statistics of Indonesia 2021*. Jakarta. Available at https://www.esdm.go.id/en/publication/handbook-of-energy-economic-statistics-of-indonesia-heesi#.