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## **Technical analysis of the third biennial update report of Paraguay submitted on 30 August 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 Paraguay, conducted by a team of technical experts in accordance with the modalities and procedures contained in the annex to decision 20/CP.19.



## Abbreviations and acronyms

2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
AD	activity data
BUR	biennial update report
CBIT	Capacity-building Initiative for Transparency
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
EF	emission factor
ETF	enhanced transparency framework under the Paris Agreement
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
ICA	international consultation and analysis
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	<i>Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories</i>
IPCC good practice guidance for LULUCF	<i>Good Practice Guidance for Land Use, Land-Use Change and Forestry</i>
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
N <sub>2</sub> O	nitrous oxide
NA	not applicable
NAMA	nationally appropriate mitigation action
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NIR	national inventory report
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
PFC	perfluorocarbon
PNCC	National Climate Change Policy of Paraguay
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	<i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</i>
SF <sub>6</sub>	sulfur hexafluoride
SIAM	Environmental Information System of Paraguay
TNA	technology needs assessment
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. Paraguay submitted its second BUR on 27 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, Paraguay participated in the ninth workshop for the facilitative sharing of views, convened remotely from 24 to 27 November 2020.
5. This summary report presents the results of the technical analysis of the third BUR of Paraguay, 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

6. In accordance with the mandate referred to in paragraph 2 above, Paraguay submitted its third BUR on 30 August 2021 as a stand-alone update report. The submission was made within two years and eight months from the submission of the second BUR. During the technical analysis, the Party explained that the reason for submitting the BUR more than two years after the submission of the last BUR was the coronavirus 2019 pandemic.
7. A desk analysis of Paraguay's BUR was conducted remotely from 29 November to 3 December 2021 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: Ahmad Wafiq Aboelnasr (Egypt), Ana-Maria Danila (former member of the Consultative Group of Experts from the European Union), Andres B. Espejo (Spain), Reza Fallah (Islamic Republic of Iran), Domenico Gaudio (Italy), Olga Gavrilova (Estonia), Agustín José Inthamoussu (Uruguay), Traute Koether (Austria), Juan Luis Martín Ortega (El Salvador), Stanford Mwakasonda (member of the Consultative Group of Experts from the United Republic of Tanzania), Diana Camila Rodríguez Vargas (Colombia), Raúl Salas Reyes (Mexico), Caroline Tagwireyi (Zimbabwe) and Alexander Zahar (Australia). Ms. Gavrilova and Mr. Salas Reyes were the co-leads. The technical analysis was coordinated by Pedro Torres, Nalin Srivastava and Nashib Kafle (secretariat).
8. 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 Paraguay engaged in consultation<sup>1</sup> on the identification of capacity-building needs for the preparation of BURs and participation in the ICA process. Following the technical analysis of Paraguay's third BUR, the TTE prepared and shared a draft summary report with

<sup>1</sup> The consultation was conducted via videoconferencing.

Paraguay on 15 February 2022 for its review and comment. Paraguay, in turn, provided its feedback on the draft summary report on 4 May 2022.

9. The TTE responded to and incorporated Paraguay's comments referred to in paragraph 8 above and finalized the summary report in consultation with the Party on 10 May 2022.

## **II. Technical analysis of the biennial update report**

### **A. Scope of the technical analysis**

10. 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).

11. The remainder of this chapter presents the results of each of the three parts of the technical analysis of Paraguay's BUR outlined in paragraph 10 above.

### **B. Extent of the information reported**

12. The elements of information referred to in paragraph 10(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.

13. 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 12 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.

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

15. Regarding the areas for enhancing understanding of the extent of the information reported in the BUR noted by the previous TTE in the summary report on the technical analysis of the Party's previous BUR, Paraguay identified the areas that were not addressed in its current BUR (p.247). They include improving the institutional arrangements for implementing an MRV system, for which no significant progress was made and capacity-building is still needed.

## C. Technical analysis of the information reported

16. The technical analysis referred to in paragraph 10(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.

17. 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.

18. 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

19. 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.

20. In its third BUR, Paraguay provided information on its national circumstances, including a description of its geography, hydrography, topography, flora and fauna, territorial organization and economy that might affect the Party's ability to deal with mitigating and adapting to climate change.

21. Paraguay described in its BUR the existing institutional arrangements relevant to climate change management in the country. In 2011 the Party enacted the PNCC to promote and coordinate implementation of climate action in the country in line with national priorities and international commitments. In 2017 Paraguay established the National Climate Change Commission as an inter-institutional entity with consultative competences and the Directorate General on Climate Change as the executive body of the PNCC.

22. Paraguay's third BUR does not include detailed information on the institutional arrangements and improvement plans for the preparation and submission of NCs and BURs on a continuous basis. During the technical analysis, Paraguay indicated that the most relevant institutional arrangements for the periodic preparation of national reports comprise the sectoral working groups for inventory preparation and the NDC working group.

23. The TTE noted that the transparency of the information reported on institutional arrangements could be further enhanced by addressing the areas noted in paragraph 22 above, which could facilitate a better understanding of the information reported on institutional arrangements.

24. Paraguay reported in its third BUR (chap. 3) an update on its proposed domestic MRV system, including information on adaptation, the GHG emissions inventory and preparing reports, and mitigation actions. The description covers key aspects of the institutional arrangements for the planned domestic MRV system, including adopting inter-institutional working groups, establishing SIAM and the proposed MRV system presented in the Party's updated NDC.

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

25. As indicated in table I.1, Paraguay 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. Paraguay submitted its third BUR in 2021 and the GHG inventory reported is for 1990–2017. The GHG inventory is consistent with the requirements for the reporting time frame. During the technical analysis, Paraguay informed the TTE that in 2022 it is considering reporting its GHG inventory for up to 2019, thus reducing the gap to three years, subject to support received.

27. GHG emissions and removals for the BUR covering the 1990–2017 inventories were estimated using mainly tier 1 methodologies from the 2006 IPCC Guidelines. Country-specific EFs were used for some categories in the agriculture, forestry and other land use sector, such as forest land remaining forest land (4.A.1) and forest land converted to cropland (4.B.1). The TTE commends the Party for its efforts to implement higher-tier methods than those used for the previous GHG inventory for some categories.

28. Information on AD and EFs used and their sources was clearly reported in the BUR, including a set of tables with information on AD and EFs by category or subcategory for the whole time series (BUR annex 2).

29. Information on the Party’s total GHG emissions by gas for 2017 is outlined in table 1 in Gg CO<sub>2</sub> eq. It shows a decrease in emissions including LULUCF of 0.2 per cent since 1990 (49,967.42 Gg CO<sub>2</sub> eq).

Table 1  
**Greenhouse gas emissions by gas of Paraguay for 2017**

<i>Gas</i>	<i>GHG emissions including LULUCF (Gg CO<sub>2</sub> eq)</i>	<i>% change 1990–2017</i>	<i>GHG emissions excluding LULUCF (Gg CO<sub>2</sub> eq)</i>	<i>% change 1990–2017</i>
CO <sub>2</sub>	22 535.24	–33.8	8 024.26	246.0
CH <sub>4</sub>	17 583.85	64.5	17 583.85	64.5
N <sub>2</sub> O	9 224.24	76.0	9 224.24	76.0
HFCs	492.37	NA	492.37	NA
PFCs	NA, NO	NA	NA, NO	NA
SF <sub>6</sub>	19.84	107.5	19.84	107.5
Other	NE, NA, NO	NA	NE, NA, NO	NA
<b>Total</b>	<b>49 855.53</b>	<b>–0.2</b>	<b>35 344.56</b>	<b>93.6</b>

30. Paraguay used notation keys in tables where numerical data were not provided. The use of notation keys was consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties, which facilitated a better understanding of the information reported.

31. Paraguay reported comparable information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF and the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines.

32. The shares of emissions that different sectors contributed to the Party’s total GHG emissions excluding LULUCF, as calculated by the TTE using information from the BUR, in 2017 are reflected in table 2.

Table 2  
**Shares of greenhouse gas emissions by sector of Paraguay for 2017**

<i>Sector</i>	<i>GHG emissions (Gg CO<sub>2</sub> eq)</i>	<i>% share<sup>a</sup></i>	<i>% change 1990–2017</i>
Energy	8 116.71	23.0	225.8
IPPU	907.21	2.6	254.8
Agriculture	25 027.22	70.8	67.3
LULUCF	14 510.98	NA	–54.2
Waste	1 293.42	3.7	133.5

<sup>a</sup> Share of total emissions without LULUCF.

33. Paraguay 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.

34. For the energy sector, information was clearly reported on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories, notation keys used and other information specific to the sector. The sector is the Party's third largest source of emissions, accounting for 8,116.71 kt CO<sub>2</sub> eq in 2017, 23 per cent of its GHG emissions excluding LULUCF. Energy sector emissions have increased since 1990, owing mostly to an increase in the consumption of fossil fuels in road transportation. CO<sub>2</sub> emissions from road transportation is a key category. To estimate emissions for the energy sector, Paraguay used mostly tier 1 methods and default EFs from the 2006 IPCC Guidelines.

35. The IPPU sector accounted for 2.6 per cent of the Party's total emissions excluding LULUCF in 2017. Information on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories, notation keys used and other information specific to the sector was clearly reported, mostly in the annexes to the BUR. IPPU sector emissions have increased since 1990, owing mostly to cement production, which is the largest contributing category in the sector, and to HFC emissions in later years of 1990–2017. Emissions for the sector were estimated using tier 1 methods and default EFs from the 2006 IPCC Guidelines, except for cement production, for which Paraguay used plant-specific AD and EFs. Emissions from petrochemical and carbon black production (category 2.B.8) were reported as "NE".

36. For the agriculture sector, agricultural soils (N<sub>2</sub>O), enteric fermentation (CH<sub>4</sub>) and rice cultivation (CH<sub>4</sub>) were identified as key categories. Agriculture sector emissions have increased since 1990, owing mostly to an increase in CH<sub>4</sub> emissions from enteric fermentation, which accounts for about 60 per cent of the sectoral emissions. Paraguay used tier 1 methods and default EFs from the 2006 IPCC Guidelines to estimate emissions. CO<sub>2</sub> emissions from the application of limestone to soils (category 3.G.1) were reported as "NE".

37. For the LULUCF sector, Paraguay reported annual GHG emissions and removals for 1990–2017, in which net emissions fluctuated between a maximum of 46,103.41 Gg CO<sub>2</sub> eq in 2014 and a minimum of 9,706.72 Gg CO<sub>2</sub> eq in 2012. Forest land remaining forest land, cropland converted to forest land, forest land converted to cropland, grassland remaining grassland, and forest land converted to grassland were identified as key categories. Emissions from cropland have decreased by about 72.0 per cent since 1990, while emissions from grassland increased by 165.6 per cent in 1990–2017. Emissions were estimated using a combination of tier 1 and 2 methods and default EFs from the 2006 IPCC Guidelines. The Party reported as "NE" emissions from wetlands remaining wetlands (category 4.D.1), settlements remaining settlements (4.E.1), other land remaining other land (4.F.1) and harvested wood products (4.G).

38. For the waste sector, information on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories, notation keys used and other information specific to the sector was clearly reported. CH<sub>4</sub> emissions from solid waste disposal is a key category. The increase in emissions shown by this category since 1990 is a result of the country's increasing population and consequent increase in solid waste disposal and domestic wastewater treatment and discharge. Paraguay used tier 2 methods and default EFs from the 2006 IPCC Guidelines to estimate CH<sub>4</sub> emissions from solid waste disposal and CO<sub>2</sub> emissions from incineration and open burning of waste. Other categories in the waste sector were estimated using tier 1 methods and default EFs from the 2006 IPCC Guidelines.

39. The BUR provides an update to all of the GHG inventories reported in the Party's previous NCs and BURs. The information reported provides an update for inventory years 1990, 1995, 2000, 2005, 2010 and 2015 in summary format. The update was carried out using the methodologies contained in the 2006 IPCC Guidelines, thus generating a consistent 28-year time series. The Party reported that it recalculated emissions for all sectors for 1990–2015 owing to several improvements in AD (revised energy balance, new land representation, etc.) and EFs, which are listed in the BUR (section 8). The Party also reported that the recalculations resulted in a 31.8 per cent increase in estimated emissions for 2015 but an 8–19.4 per cent decrease in estimated emissions for the previous years.

40. The reasons for the significant recalculations for the LULUCF sector were not reported in the BUR. The TTE determined that the recalculations are attributable to the overhaul of AD for the conversion of forest land to other land in 2012–2017. Paraguay

clarified that these changes resulted from the use of new maps for land use and land-use change, generated by the National Forest Institute.

41. Paraguay described in its BUR the institutional framework for the preparation of its 2017 GHG inventory. The Party reported that the Ministry of Environment and Sustainable Development is the governmental body responsible for climate change policies and the national GHG inventory. In the BUR, Paraguay clarified that focal points designated by data-providing institutions formed four sectoral working groups (for the energy, IPPU, agriculture, forestry and other land use, and waste sectors). Meetings of these working groups were held in 2020–2021.

42. Paraguay clearly reported that a key category analysis was performed for the level of and trend in emissions.

43. The BUR provides information on quality assurance/quality control measures for all sectors. Paraguay reported that quality assurance was conducted by a team of international experts who did not participate in the elaboration of the GHG inventory. The Party identified improvements in the information reported for all sectors of the inventory and listed such improvements in the BUR (section 8).

44. Paraguay reported information on CO<sub>2</sub> emissions from fuel combustion using both the sectoral and the reference approach, along with an examination of the difference between the results obtained using the two approaches. Emission estimates calculated using the sectoral approach were 0.04 per cent higher than those calculated using the reference approach for 2017.

45. Paraguay clearly reported information on international aviation, stating that emissions were estimated using international landing and take-off data. Information on marine bunker fuels was not reported separately; however, the Party provided relevant clarification in the BUR, stating that it encountered difficulties in collecting national data for estimating emissions from maritime and fluvial navigation activities. The data available from the national energy balance are not disaggregated by type of transport and, as such, emissions from international navigation cannot be reported separately in the BUR.

46. Paraguay reported information on the uncertainty assessment (level) of its GHG inventory. The uncertainty analysis was based on IPCC approach 2 and covers all source categories. The results obtained, as reported in the BUR, reveal that the level of uncertainty of the emission estimates for 2017 is between –85.3 and +73.2 per cent. As explained in the BUR, the uncertainty is driven mostly by the complexity of emission and removal estimates for the LULUCF sector, the uncertainty in AD for the agriculture sector and the use of default EFs from the 2006 IPCC Guidelines.

47. The TTE commends Paraguay for providing in its BUR information on the uncertainty assessment, including an explanation of the uncertainty in its GHG inventory. The TTE noted that information on the uncertainty assumed for each tested parameter was not reported in Paraguay's BUR and the reason for this was not clear to the TTE.

48. The TTE noted that the transparency of the information reported on GHG inventories could be further enhanced by addressing the areas noted in paragraphs 40, 45 and 47 above, which could facilitate a better understanding of the information reported on GHG inventories.

49. In paragraph 50 of the summary report on the technical analysis of Paraguay's second BUR, the previous TTE noted areas where the transparency of the reporting on GHG inventories could be enhanced. The current TTE noted the implementation of the improvements in the BUR referred to in paragraphs 31 and 41 above and commends the Party for enhancing the transparency of its reporting.

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

50. As indicated in table I.2, Paraguay 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.



51. The information reported provides a clear and comprehensive overview of the Party's mitigation actions and their effects. In its BUR, Paraguay reported information on its national context and framed its national mitigation planning and actions in the context of its NDC, according to which Paraguay is committed to reducing its GHG emissions by 20 per cent by 2030 compared with the projected level of emissions for the same year. Paraguay developed policy instruments to achieve its NDC on the basis of its National Development Plan 2030, PNCC and National Environmental Policy. These policy instruments include the 2014 Mitigation Strategy, the National Climate Change Mitigation Plan and seven action programmes developed in 2017. Paraguay updated its NDC in July 2021 and reported that climate change has been mainstreamed in and integrated into five prioritized climate change sectoral plans. Most of the mitigation actions reported in Paraguay's third BUR are in the LULUCF sector.

52. The Party provided an overview of its first NDC, as well as an overview of its updated NDC, covering 45 mitigation actions. Paraguay highlighted that the mitigation actions reported in its third BUR are based on those reported in its updated NDC. The highest estimated emission reduction was reported for the IPPU sector (30,509,694 t CO<sub>2</sub> eq between 2024 and 2045). The TTE acknowledged the information, which is presented in this summary report as contextual without assessing the completeness and transparency of the information in the NDC.

53. 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 mitigation actions reported in the BUR (chap. 3) cover energy (including transport), IPPU, agriculture (including livestock), LULUCF and waste. The Party also reported information on its mitigation actions in narrative format.

54. Information on quantitative goals was not reported for most mitigation actions in the waste sector. During the technical analysis, the Party clarified that the reporting of such information was hampered by a lack of institutional arrangements (e.g. at the municipal level), gaps in the available information (e.g. understanding waste flows from source to disposal) and a lack of regulatory mechanisms (e.g. regulatory decree for a measure to reduce paper use in the public sector).

55. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Paraguay clearly reported the names of mitigation actions, coverage (sector and gases) and progress indicators and provided a description of the mitigation actions reported in the BUR (chap. 3). Paraguay reported both CO<sub>2</sub> and non-CO<sub>2</sub> GHG emissions affected by the mitigation actions. Additionally, the Party reported co-benefits (i.e. non-GHG effects) of its mitigation actions, covering environmental, social and economic consequences. The TTE commends Paraguay for its efforts to provide information on non-CO<sub>2</sub> GHG emissions and co-benefits of its mitigation actions, which significantly increases transparency.

56. Paraguay clearly reported information on methodologies and assumptions and the objectives of all mitigation actions in the energy and transport, IPPU, agriculture and livestock, LULUCF and waste sectors. Information on steps taken or envisaged to achieve those actions was clearly reported for all mitigation actions in the IPPU, agriculture and livestock, LULUCF and waste sectors.

57. Paraguay reported that, while most of its electricity is generated from hydroelectric and biomass sources, the transport sector remains dependent on fossil fuels. The mitigation actions in the energy and transport sectors focused mainly on substituting fossil fuels with biofuels, promoting efficient driving practices for public and cargo transport, substituting conventional vehicles for electric and hybrid vehicles, and promoting sustainable mobility based on green hydrogen (i.e. hydrogen produced by means other than fossil fuels). Most of these mitigation actions were reported as ongoing or planned. The Party clearly reported information on the progress of implementation of actions in the energy and transport sector.

58. The mitigation actions in the IPPU sector focused mainly on reducing the amount of clinker used in cement production and the amount of cement kiln dust produced in cement kilns, promoting a circular economy for glass production and reducing the use and import of HFCs. Most mitigation actions were reported as ongoing. The Party provided qualitative information on studies being carried out to identify additional measures in the IPPU sector,

particularly on establishing centres for recovering, recycling and storing fluorinated substitutes for ozone-depleting substances used as refrigerants. The Party reported that reducing the use and import of HFCs is expected to reduce GHG emissions by 30,509,694 t CO<sub>2</sub> eq in 2024–2045; while reducing the amount of clinker in cement production was initiated in 2019 and is expected to reduce GHG emissions by 641,139 t CO<sub>2</sub> by 2030.

59. The mitigation actions in the agriculture and livestock sector, reported as ongoing or planned, focused mainly on reducing emissions from the enteric fermentation of cattle by improving feed quality, efficiently using nitrogen-based fertilizers in crop production and reducing emissions from the use of nitrogen-based fertilizers in horticultural production. The Party reported the results of implementing its mitigation actions as mitigation co-benefits, including decision-making based on gender-disaggregated indicators to better inform gender equality measures in the agriculture and livestock sector. Efficient use of nitrogen-based fertilizers was initiated in January 2021 and is expected to reduce GHG emissions by 1,027 Gg CO<sub>2</sub> eq by 2030.

60. The mitigation actions in the LULUCF sector, reported as ongoing or planned, focused mainly on direct sowing, disseminating conservation agricultural practices on family farms, defining a legal framework to prohibit transformation and conversion of wooded areas in the eastern region of the country, certifying forests for environmental services and market revitalization, establishing forest plantations for energy and timber purposes, re-establishing forests and increasing forest area through conservation schemes. The Party reported the results of implementing its mitigation actions as mitigation co-benefits, including social, environmental and economic benefits such as climate change adaptation, biodiversity conservation and integration of indigenous and farming communities. Establishing forest plantations for energy and timber purposes was initiated in January 2020 and is expected to reduce GHG emissions by 14,950 Gg CO<sub>2</sub> eq by 2030.

61. The mitigation actions in the waste sector, reported as implemented or ongoing, focused mainly on promoting separation and biological treatment of food waste through composting, capture and combustion of CH<sub>4</sub> generated at landfills; reducing paper use in the public sector; implementing effluent treatment plants (i.e. anaerobic lagoons); and incorporating aerobic stages in anaerobic lagoons for the alcohol and sugar industries. The Party reported the results of implementing its mitigation actions as mitigation co-benefits, including social and environmental benefits such as reducing environmental pollution and improving water management and the quality of life of its citizens. Capture and combustion of CH<sub>4</sub> generated at landfills started in January 2021 and is expected to reduce GHG emissions by 831,256 t CO<sub>2</sub> eq by 2030.

62. Paraguay carried out a survey to obtain information on other mitigation actions with the potential to reduce GHG emissions rolled out by the Government, civil society, non-governmental organizations and the productive sector. Relevant information was reported in annexes 1–4 to chapter 3 of the BUR. All such actions were reported as implemented or ongoing. The Party reported the name and nature of the actions, the institutions responsible for implementing them, the sectors and gases covered (including CO<sub>2</sub> and non-CO<sub>2</sub> emissions) and their progress of implementation. Other information such as methodologies and assumptions used and outcomes estimated for the mitigation actions covered in the survey was not reported. During the technical analysis, Paraguay clarified that the survey was intended only to obtain initial information on the policies, measures, actions and initiatives rolled out in the national territory with a view to their subsequent prioritization based on their potential to support the achievement of the NDC.

63. The Party reported that the methodologies used to estimate the impacts (in terms of emissions) of mitigation actions are in line with the 2006 IPCC Guidelines and that some of the methodologies are also consistent with those used for the GHG inventory. It was unclear to the TTE from the BUR why not all of the methodologies were reported as being consistent with those used for the GHG inventory. During the technical analysis, Paraguay confirmed that all methodologies are in line with those used for the GHG inventory.

64. Information on steps taken or envisaged to achieve the mitigation actions was not reported for most mitigation actions in the energy and transport sector. During the technical analysis, Paraguay clarified that this information was not reported owing to the lack of

disaggregated data for transport and difficulties in monitoring the progress of mitigation actions.

65. Information on progress of implementation was not reported for some mitigation actions. During the technical analysis, Paraguay mentioned that, in addition to the challenges related to the absence of institutional arrangements, financial and technical capacity are needed to implement mitigation actions (e.g. electric mobility and zero-emission road transport, and reducing consumption and imports of HFCs used in refrigeration).

66. The Party reported in the BUR information on results achieved, such as estimated outcomes and estimated emission reductions. Quantitative estimates were provided for mitigation actions in the IPPU, agriculture, LULUCF and waste sectors. For mitigation actions in the energy and transport sectors, the Party did not provide quantitative information on emission reductions. During the technical analysis, Paraguay clarified that it was not able to provide this information owing to the lack of (quality) data, as well as the lack of technical capacity and formal institutional arrangements for collecting the required data; limited human resources; time constraints; and challenges posed by the pandemic.

67. Paraguay provided information on its involvement in international market mechanisms as a Party to the Kyoto Protocol. Paraguay documented two clean development mechanism projects approved by its designated national authority and verified under the UNFCCC clean development mechanism process. Paraguay also reported information on other voluntary markets, including seven REDD+ projects registered under the Verified Carbon Standard,<sup>2</sup> of which three are being validated, two are being implemented, one is under development and one has been submitted for approval.

68. Paraguay reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that Paraguay is in the process of developing and establishing a domestic MRV system for mitigation actions. It reported that the development of the MRV system started in 2019. The BUR includes a reference to the updated NDC of July 2021,<sup>3</sup> which states that the Party is planning MRV arrangements for its GHG emissions (which will cover the national GHG inventory system), mitigation policies, actions and plans, REDD+, support received and financial needs.

69. However, the progress of the development of the MRV arrangements for mitigation actions since 2019 was not clear to the TTE. During the technical analysis, Paraguay clarified that the Ministry of Environment and Sustainable Development has SIAM and a climate change module is under development to enable public and private institutions to record their mitigation actions and provide the information required to measure progress; however, the climate change module in SIAM is not yet operational. The Party highlighted that a CBIT project for establishing an integral MRV and monitoring and evaluation system for improving transparency, which has been approved and is expected to be finalized in 2024, will support the development and implementation of SIAM.

70. Paraguay reported consistently with the voluntary general guidelines for domestic MRV of domestically supported NAMAs, contained in the annex to decision 21/CP.19. The Party provided detailed information on the development of four NAMA projects – on livestock, transport, hydrogen, and energy efficiency in the residential sector. The TTE commends Paraguay for providing additional information on the four NAMA projects being developed.

71. The TTE noted that the transparency of the information reported on mitigation actions could be enhanced by addressing the areas noted in paragraphs 54, 62–66 and 69 above, which could facilitate a better understanding of the information reported on mitigation actions.

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<sup>2</sup> See <https://verra.org>.

<sup>3</sup> Available at [https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Paraguay%20First/ACTUALIZACION%20DE%20LA%20NDC%20DEL%20PARAGUAY\\_Versi%C3%B3n%20Final.pdf](https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Paraguay%20First/ACTUALIZACION%20DE%20LA%20NDC%20DEL%20PARAGUAY_Versi%C3%B3n%20Final.pdf) (in Spanish).

72. In paragraph 60 of the summary report on the technical analysis of Paraguay's second BUR, the previous TTE noted areas where the transparency of the reporting on mitigation actions could be further enhanced, including information on quantitative goals and progress indicators, methodologies and assumptions, and international market mechanisms. The current TTE noted the improvements referred to in paragraphs 53, 55 and 67 above and commends the Party for enhancing the transparency of its reporting.

73. Paraguay reported in the BUR (chap. 4) information on the CBIT project aimed at deploying its MRV system for compliance with requirements under the ETF. During the technical analysis, Paraguay highlighted that the project will help it to understand the effects of its mitigation policies and measures and track progress towards implementation of its NDC. The TTE commends the Party for reporting on its proactive approach to preparing for ETF implementation.

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

74. As indicated in table I.3, Paraguay 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.

75. Paraguay clearly reported information on constraints and gaps and related financial, technological and capacity-building needs in accordance with decision 2/CP.17, annex III, paragraph 14. In its BUR (p.229), Paraguay identified its high vulnerability to the impacts of climate change and status as a developing country as the main challenges in implementing climate action. The BUR (section 2, chap. 4) contains an extensive list of constraints and gaps and related financial, technological and capacity-building needs in the areas of adaptation, the GHG emissions inventory, mitigation, climate finance, NDC implementation and international negotiations.

76. Paraguay reported information on constraints and gaps related to assessing the socioeconomic impact of decarbonization; assessing public expenditure on climate change; developing a climate finance MRV system; developing a tracking system for identifying investments in climate change; and developing a legal framework for climate finance (section 2.4, chap. 4).

77. It was not clear to the TTE what corresponding needs the Party has in order to address its reported constraints and gaps. During the technical analysis, the Party indicated the needs related to each constraint and gap and clarified that enhancing the technical capacity of its national experts in climate finance is an overarching need.

78. Paraguay 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, Paraguay reported that it received USD 181,006,412 from multilateral and bilateral donors, which included an allocation of USD 852,000 for preparing its third BUR and NC4. Paraguay reported in the BUR (annex to chap. 4, p.400) a list of projects implemented with international support in areas including mitigation, adaptation, capacity-building, and developing the GHG emissions inventory and preparing reports. The information reported includes details on the project names and objectives, the national institutions involved, the implementation period, the status of the projects, the finance received and the source of finance. The projects received support from the Adaptation Fund, the GCF, the GEF and bilateral donors such as the European Union, the Netherlands and Spain.

79. Information on technology transfer was not clearly reported in Paraguay's BUR. The TTE noted that, although the Party provided comprehensive information in the BUR on support received, the information on technology transfer concerned only one project. During the technical analysis, the Party clarified that it does not have sufficient human resources to provide comprehensive information on support received in the area of technology transfer.

80. The Party reported in its BUR an extensive list of existing technology needs in different areas in accordance with decision 2/CP.17, annex III, paragraph 16. However, the nature and extent of those needs was not clearly reported in the BUR. Furthermore, the TTE

noted that the Party did not explain whether a national TNA was conducted and, if so, what the results of that assessment were. During the technical analysis, Paraguay clarified that, while technology needs were not assessed at the national level, a TNA and technology action plan are due to be developed in 2021–2023 with the support of the GCF (see p.258 of the BUR). The TTE noted that reporting progress in developing the TNA and technology action plan would further enhance the transparency of the BUR.

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 76, 79 and 80 above, which could facilitate a better understanding of the information reported on needs and support received.

82. In paragraphs 63–64 of the summary report on the technical analysis of the Party's second BUR, the previous TTE noted areas where the transparency of the reporting on constraints, gaps, needs, and support needed and received could be further enhanced. The current TTE noted the improvements referred to in paragraph 78 above and commends the Party for enhancing the transparency of its reporting.

## 5. Any other information

83. Paraguay reported some information on adaptation action that may lead to GHG emission reductions, without providing estimations of such reductions. During the technical analysis, Paraguay clarified that no efforts had previously been made to quantify the mitigation effects of the adaptation measures because they were implemented via programmes developed with the intention of enhancing adaptive capacity. Paraguay is establishing a process for quantifying on an ongoing basis the emission impacts of such measures.

## D. Identification of capacity-building needs

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

(a) Developing institutional arrangements and collecting data to assist in defining quantitative goals for mitigation actions;

(b) Enhancing institutional arrangements to enable better data-gathering activities, with a focus on bottom-up and disaggregated transport sector data, and enhancing monitoring of implementation of mitigation actions in the energy sector;

(c) Enhancing institutional arrangements for mitigation actions, with a focus on improving data-collection practices and quality assurance/quality control of available data, building technical capacity to estimate reductions and other outcomes (e.g. social consequences) of implementing mitigation actions, defining roles and responsibilities within institutions responsible for reporting progress of mitigation actions, and developing internal training of stakeholders to address future rotation of human resources;

(d) Enhancing implementation of mitigation actions in the energy and transport sector (e.g. electric mobility and zero-emission road transport) and the IPPU sector (e.g. reducing consumption of HFCs used in refrigeration and reducing HFC imports), and enhancing technical capacity to identify low-carbon technology options (e.g. low GWP technologies to reduce consumption of HFCs used in refrigeration);

(e) Developing MRV arrangements for mitigation actions that enable compliance with the reporting obligations under the ETF and assist in tracking progress towards the NDC through workshops and in-country consultancy support covering topics such as good practices and lessons learned from other countries on how they are tracking progress towards their NDCs. This support is intended to complement existing support received under the CBIT project while avoiding potential overlap with ongoing efforts;

(f) Enhancing the capacity of national experts in climate finance matters by building and creating capacity for assessing the socioeconomic impact of mitigation actions; for applying climate change public budget tagging methodologies and assessing public

expenditure; and for implementing climate finance MRV activities, including tracking climate finance flows, assessing costs of mitigation and adaptation actions, and reporting;

(g) Enhancing the identification and assessment of technology needs and the development of technology action plans in line with national mitigation and adaptation priorities;

(h) Enhancing the capacity of national experts to develop links between the different MRV components (GHG inventory, mitigation, adaptation and climate finance) for effective tracking of NDC actions and objectives.

85. The TTE noted that, in addition to those identified during the technical analysis, Paraguay reported in its BUR (chap. 4) several capacity-building needs, covering the following areas:

- (a) GHG inventory and report preparation;
- (b) Mitigation actions;
- (c) Adaptation to climate change;
- (d) Climate finance;
- (e) NDC implementation;
- (f) International negotiations.

86. In paragraphs 67–68 of the summary report on the technical analysis of Paraguay second BUR, the previous TTE, in consultation with Paraguay, identified capacity-building needs. Paraguay reported the status of those capacity-building needs in its BUR (section 2.7, chap. 4) as ongoing:

- (a) Improving the institutional arrangements for preparing NCs and BURs on a continuous basis;
- (b) Strengthening institutional capacity to implement an MRV system;
- (c) Designing and implementing an MRV system for mitigation actions that includes data collection, processing and analysis, including for private sector projects, and a climate finance tracking system to facilitate monitoring and reporting of information on financial resources received;
- (d) Developing and using higher-tier methodologies for estimating emissions;
- (e) Developing the capacity of the inventory team and the institutions in charge of generating and providing data to carry out uncertainty analysis;
- (f) Enhancing national capacity to report mitigation actions;
- (g) Identifying and formulating baselines, scenarios, methodologies and assumptions for estimating the effects of mitigation actions, and monitoring the progress of mitigation actions;
- (h) Identifying gaps and constraints related to the preparation of BURs;
- (i) Reporting the information generated by the working group on climate finance in the BUR;
- (j) Assessing technology needs in a nationally determined manner.

### III. Conclusions

87. The TTE conducted a technical analysis of the information reported in the third BUR of Paraguay 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; the national inventory of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol; 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; and the level of support received to enable the preparation and submission of BURs. During the technical analysis, additional information was provided by Paraguay on the progress in designing and implementing MRV arrangements to support its NDC commitments. The TTE concluded that the information analysed is mostly transparent.

88. Paraguay reported information on the institutional arrangements relevant to climate change management in the country, including preparing reports. The Party has made considerable efforts in this respect, including enacting the Climate Change Law, establishing a National Climate Change Commission and forming working groups for climate change MRV activities. Paraguay reported significant progress in establishing a domestic MRV system that will allow for sustainable preparation of reports.

89. In its third BUR, submitted in 2021, Paraguay reported information on its national GHG inventory for 1990–2017. This included GHG emissions and removals of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs and SF<sub>6</sub> for all relevant sources and sinks. Estimates of fluorinated gases were only partially provided owing to difficulties in obtaining the necessary data, as clarified by the Party in the BUR. The 2006 IPCC Guidelines were used to develop the GHG inventory. Total GHG emissions in 2017 were reported as 35,344.56 Gg CO<sub>2</sub> eq (excluding LULUCF) and 49,855.53 Gg CO<sub>2</sub> eq (including LULUCF). The Party identified the main gases and 13 key categories, with CO<sub>2</sub> and land converted to grassland being identified as the main gas and key category, respectively.

90. Paraguay reported information on mitigation actions and their effects in both tabular and narrative format, including on its NDC, updated in July 2021, and other national and sectoral policies, such as its National Development Plan 2030, PNCC and National Environmental Policy. Paraguay reported planned, implemented and ongoing actions in the energy (including transport), IPPU, agriculture (including livestock), LULUCF and waste sectors. The mitigation actions focused on a wide range of initiatives, including substituting fossil fuels in the transport sector, improving industry practices, reducing emissions from enteric fermentation, disseminating conservation agricultural practices, and promoting capture and combustion of CH<sub>4</sub> generated at landfills.

91. The Party reported the progress of implementation of its mitigation actions and the results achieved, including emission reductions and estimated outcomes for some of those actions. However, for mitigation actions in the energy and transport sectors information on results achieved was not reported. The highest emission reduction was reported for the IPPU sector, amounting to 30,509,694 t CO<sub>2</sub> eq between 2024 and 2045. Paraguay also reported social, environmental and economic co-benefits of its mitigation actions, including using gender-disaggregated data collected to inform gender equality analyses, reducing environmental pollution and improving its citizens' quality of life. The Party further reported information on its involvement in international market mechanisms and MRV arrangements.

92. Paraguay provided extensive information in its BUR on the main gaps and related financial, technological and capacity-building needs in the areas of adaptation, the GHG emissions inventory and preparing reports, mitigation, climate finance, NDC implementation and international negotiations. Information was reported on financial resources, technology transfer and capacity-building support received from the Adaptation Fund, the GCF, the GEF and bilateral donors such as the European Union, the Netherlands and Spain. Paraguay reported that it received USD 181,006,412 from multilateral and bilateral donors, which included an allocation of USD 852,000 for preparing its third BUR and NC4. Information on technology needs was not extensively reported owing to the absence of a TNA, as clarified by the Party during the technical analysis. Furthermore, information on technology support received was not clearly reported in the BUR owing to the lack of technical capacity of national experts in this regard.

93. The current TTE noted improvements in the reporting in the Party's third BUR compared with that in its previous 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 improvement.

94. The TTE, in consultation with Paraguay, identified the eight 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. The Party, in consultation with the TTE, also identified the need for capacity-building to facilitate transition to the ETF referred to in paragraph 84(e) above. Paraguay identified the six capacity-building needs listed in paragraph 84(b–e) and (g–h) as high priority, while it identified those listed in paragraph 84(a) and (f) as medium priority.



## Annex I

### Extent of the information reported by Paraguay 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 Paraguay**

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
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	Paraguay submitted its third BUR in 2021; the GHG emissions inventory reported is for 1990–2017.
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	Paraguay 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.	Yes	
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;	Yes	The tables were presented in annex 8.1 to the BUR.
	(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.	Yes	The time series reported in the BUR covers 1990–2017.
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).	Yes	This information was reported for 1990, 1995, 2000, 2005, 2010 and 2015.
Decision 2/CP.17, annex III, paragraph 9	The inventory section of the BUR should consist of an NIR as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National GHG inventories), including:		
	(a) Table 1 (National GHG inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by	Yes	Comparable information was reported in table 2.5 of the BUR. The Party used notation keys to

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
	the Montreal Protocol and greenhouse gas precursors);		report information on GHG precursors.
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF <sub>6</sub> ).	Yes	Comparable information was reported in table 2.5 of the BUR. The Party used notation keys to report information on PFC emissions.
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex.	Yes	The Party reported sector-specific information, including methods, AD and EFs, in annexes 1–7 and 8.1–8.2 to chapter 2 of the BUR (pp.261–417).
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.	Yes	
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 <sub>2</sub> ;	Partly	The Party reported as “NE” CO <sub>2</sub> emissions for some categories of the IPPU (2.B.8), agriculture (3.G.1) and LULUCF (4.D.1, 4.E.1, 4.F.1 and 4.G) sectors.
	(b) CH <sub>4</sub> ;	Partly	The Party reported as “NE” CH <sub>4</sub> emissions for some categories of the IPPU (2.B.8), agriculture (3.E and 3.F), LULUCF (all main categories) and waste (5.B) sectors.
	(c) N <sub>2</sub> O.	Partly	The Party reported as “NE” N <sub>2</sub> O emissions for some categories of the IPPU (2.G), agriculture (3.E and 3.F), LULUCF (all main categories) and waste (5.B) sectors.
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:		
	(a) HFCs;	Yes	
	(b) PFCs;	Yes	
	(c) SF <sub>6</sub> .	Yes	

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
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) Carbon monoxide;	No	
	(b) Nitrogen oxides;	No	
	(c) Non-methane volatile organic compounds.	No	
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.	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 <sub>2</sub> 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;	Yes	
	(b) Marine bunker fuels.	No	Emissions from marine bunkers are included in the inventory but not reported separately.
Decision 17/CP.8, annex, paragraph 20	Non-Annex I Parties wishing to report on aggregated GHG emissions and removals expressed in CO <sub>2</sub> 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	The Party used the GWP 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	Yes	Paraguay used the 2006 IPCC Guidelines. Tier 1 methodologies were generally used, but tier 2

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
	Revised 1996 IPCC Guidelines, they should explicitly describe: <ul style="list-style-type: none"> <li>(i) Source and/or sink categories;</li> <li>(ii) Methodologies;</li> <li>(iii) EFs;</li> <li>(iv) AD;</li> <li>(e) Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building.</li> </ul>	Yes	methodologies were used for specific categories.
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.	Yes	
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: <ul style="list-style-type: none"> <li>(a) Level of uncertainty associated with inventory data;</li> <li>(b) Underlying assumptions;</li> <li>(c) Methodologies used, if any, for estimating these uncertainties.</li> </ul>	Yes  Partly  Yes	    The Party did not provide information on the assumed probability density functions, or a flow diagram to show how the different parameters were combined to generate the Monte Carlo simulation.

*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 Paraguay**

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
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	

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
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 quantitative goals and progress indicators for most of the mitigation actions in the waste sector was not reported.
	(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	Steps taken or envisaged were not reported for most mitigation actions in the energy and transport sectors.
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Partly	Information on progress of implementation was not reported for some mitigation actions (e.g. reducing HFC consumption in the IPPU sector).
	(ii) Progress of implementation of the underlying steps taken or envisaged;	Partly	Information on the underlying steps taken or envisaged was not reported for most mitigation actions (e.g. in the energy and transport sectors).
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Partly	Information on results achieved, such as estimated outcomes, was not reported for mitigation actions in the energy and transport sectors.
	(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 Paraguay**

<i>Decision</i>	<i>Provision of the reporting requirements</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 2/CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on:		
	(a) Constraints and gaps;	Yes	

<i>Decision</i>	<i>Provision of the reporting requirements</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
	(b) Related financial, technical and capacity-building needs.	Partly	For a small number of constraints and gaps, the corresponding needs were not reported.
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 GEF, Parties included in Annex II to the Convention and other developed country Parties, the GCF 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	The Party provided a comprehensive list of capacity-building needs, specifying the types of need. This includes overall technology needs related to climate change. However, a nationally determined TNA was not conducted.
	(b) Technology support received.	Partly	The Party reported information on a project, to be implemented in 2021–2023, to develop a TNA with the support of the GCF. However, the Party did not provide information on technology support received.

*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

IPCC. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. JL Houghton, LG Meira Filho, B Lim, et al. (eds.). Paris: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency. Available at <https://www.ipcc-nggip.iges.or.jp/public/gl/invs1.html>.

IPCC. 2000. *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*. J Penman, D Kruger, I Galbally, et al. (eds.). Hayama, Japan: IPCC/Organisation for Economic Co-operation and Development/International Energy Agency/Institute for Global Environmental Strategies. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/english/>.

IPCC. 2003. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. J Penman, M Gytarsky, T Hiraishi, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/lulucf/gp/lulucf.html>.

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

#### B. UNFCCC documents

First, second and third BURs of Paraguay. Available at <https://unfccc.int/BURs>.

NC1, NC2 and NC3 of Paraguay. Available at <https://unfccc.int/non-annex-I-NCs>.

Summary reports on the technical analysis of the first and second BURs of Paraguay, contained in documents FCCC/SBI/ICA/2016/TASR.1/PRY and FCCC/SBI/ICA/2019/TASR.2/PRY, respectively. Available at <https://unfccc.int/ICA-reports>.

#### C. Other documents

The following references may not conform to UNFCCC editorial style as some have been reproduced as received:

DNCC/MADES (2021). Actualización de la NDC de la República del Paraguay al 2030. Asunción, Paraguay. p.126. Available at [https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Paraguay%20First/ACTUALIZACION%20DE%20LA%20NDC%20DEL%20PARAGUAY\\_Versi%C3%B3n%20Final.pdf](https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Paraguay%20First/ACTUALIZACION%20DE%20LA%20NDC%20DEL%20PARAGUAY_Versi%C3%B3n%20Final.pdf) (in Spanish).