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Technical analysis of the first biennial update report of Guatemala submitted on 28 June 2023

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. 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 first biennial update report of Guatemala, 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	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
2019 Refinement to the 2006 IPCC Guidelines	*2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AD	activity data
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BUR	biennial update report
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
EF	emission factor
ETF	enhanced transparency framework under the Paris Agreement
FAOSTAT	statistical database of the Food and Agriculture Organization of the United Nations
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	*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
LT-LEDS	long-term low-emission development strategy(ies)
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
N_2O	nitrous oxide
NA	not applicable
NAMA	nationally appropriate mitigation action
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NIR	national inventory report
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
PANCC	national action plan on climate change
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. The least developed countries and small island developing States may submit at their discretion.

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. This summary report presents the results of the technical analysis of the first BUR of Guatemala, 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

5. In accordance with the mandate referred to in paragraph 2 above, Guatemala submitted its first BUR on 28 June 2023 as a stand-alone update report.

6. During the technical analysis, the Party clarified that, owing to institutional arrangement and administrative issues, the first BUR could not be submitted in a timely manner.

7. The technical analysis of Guatemala's BUR was conducted from 23 to 27 October 2023 in Panama City 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: Ahamad Wafiq Aboelnasr (Egypt), Ciniro Costa Junior (Brazil), Luis Alberto de la Torre (Peru), Javier Fernandez (Democratic Republic of the Congo), Carlos Fuller (former member of the Consultative Group of Experts from Belize), Inge GC Jonckheere (Belgium), Priscilla Karijodrono (Suriname), Mwangi James Kinyanjui (Kenya), Maria Jose Lopez (Belgium), Marcela Itzel Olguin-Alvarez (Mexico) and Virginia Sena Cianci (member of the Consultative Group of Experts from Uruguay). Maria Jose Lopez and Marcela Itzel Olguin-Alvarez were the co-leads. The technical analysis was coordinated by Gopal Raj Joshi (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 Guatemala engaged in consultation[1] on the identification of capacity-building needs for the preparation of BURs and participation in the ICA process. Following the technical analysis of Guatemala's first BUR, the TTE prepared and shared a draft summary report with Guatemala on 29 January 2024 for its review and comment. Guatemala, in turn, provided its feedback on the draft summary report on 8 May 2024.

9. The TTE finalized the summary report in consultation with the Party on 8 May 2024.

[1] The consultation was conducted via videoconferencing.

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 Guatemala'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.

C. Technical analysis of the information reported

14. 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.

15. 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.

16. 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

17. 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.

18. Guatemala reported in its first BUR information on its national circumstances, including a description of national and regional development priorities, objectives and circumstances, including features of geography, climate and economy that might affect the Party's ability to deal with mitigating and adapting to climate change, as well as information regarding national circumstances and constraints on the specific needs and concerns arising from the adverse effects of climate change and/or the impact of the implementation of response measures, as referred to in Article 4, paragraph 8, and, as appropriate, paragraphs 9–10, of the Convention.

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

20. Guatemala transparently reported in its first 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, the involvement and roles of other institutions and experts, mechanisms for information and data exchange, QA/QC procedures, and provisions for public consultation and other forms of stakeholder engagement.

21. The Ministry of Environment and Natural Resources is the national entity responsible for environmental and natural resources management, and the Vice-Ministry of Natural Resources and Climate Change is responsible for addressing climate change. Thereunder, the Department of Science and Metrics of the Directorate of Climate Change is responsible for preparing NCs and BURs (ministerial decree 214–2021), assisted by the two other departments in the Directorate and units of the Ministry of Environment and Natural Resources, which provide information and expertise in certain areas. The Guatemalan System of Climate Change Sciences assists by facilitating the compilation, integration and systematization of information provided by public and private entities, non-governmental organizations, academia and civil society. Sector-based committees for mitigation and adaptation were created in 2020 to assist with the preparation of GHG inventories, identify mitigation measures and propose adaptation measures in identified sectors.

22. Guatemala reported in its first BUR information on its domestic MRV arrangements, which indicates that the Party has established a national climate change information system, under the climate change framework legislation, for collecting, systematizing, analysing and presenting all information related to climate change at the national level. In addition, article 9 of decree 7–2013 mandates public and private entities to provide such information. The MRV system is divided into four information subsystems: a climate science subsystem, for monitoring and reporting climate variables; a subsystem for collecting and reporting information on vulnerability and adaptation to climate change and for quantifying loss and damage; a subsystem for collecting information on and reporting GHG emissions and removals; and a subsystem for MRV of support received.

23. Guatemala reported in its BUR information on its current initiatives for enhancing its MRV system for compliance with requirements under both the MRV system under the Convention and the ETF. The initiatives relate to strengthening the national GHG inventory system, developing a climate change project registry as required under the climate change law, developing monitoring systems for REDD+ activities and NAMAs, and developing indicators for measuring vulnerability, especially in the coastal zone, agriculture, livestock and food security sectors. Under the Capacity-building Initiative for Transparency, the Party plans to (1) develop a repository of data to facilitate strengthening of GHG inventory management and (2) broaden the coverage of the subsystem for MRV of support needed and received. The TTE commends the Party for the clear and comprehensive reporting on its proactive approach to preparing for ETF implementation.

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

24. As indicated in table I.1, Guatemala 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.

25. Guatemala submitted its first BUR in 2023 and the GHG inventory reported is for 1990–2018. The latest reported inventory year is more than four years prior to the date of submission of the Party's BUR. During the technical analysis, Guatemala clarified that it had intended to submit its first BUR in 2022; however, institutional arrangement and administrative issues led to delays in reporting and the late submission of the BUR to the secretariat.

26. Guatemala submitted an NIR in conjunction with its first BUR. The relevant sections of the NIR were referenced in the BUR and the document was made publicly available on the UNFCCC website.[2]

27. GHG emissions and removals for the BUR covering the 1990–2018 inventories were estimated using tier 1 and 2 methodologies from the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines. Most categories across all sectors were estimated using tier 1 methods, except for cement production in the IPPU sector and some sources and sinks (under forest land, cropland and grassland) in the LULUCF sector, for which tier 2 methods were used. Information on the methods and tiers applied for each category and subcategory was provided in the technical annex to the BUR. The TTE commends the Party for using the 2006 IPCC Guidelines.

28. Information on AD and EFs used and their sources was reported in the BUR. EFs from the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines were used for tier 1 and 2 methods, and AD were derived from official national statistics (e.g. the national energy balance, surveys of manufacturers in various industries and trading agencies, national agricultural censuses, statistics on forestry and a national survey of households). The BUR indicates that improvements to the institutional arrangements are planned with the aim of obtaining a complete time series of AD for all categories and sectors.

29. Information on the Party's total GHG emissions by gas for 2018 is outlined in table 1 in Gg CO_2 eq. It shows an increase in emissions of 44.6 per cent with LULUCF (from 42,914.60 Gg CO_2 eq in 1990 to 62,058.60 Gg CO_2 eq in 2018) and an increase of 177.7 per cent without LULUCF (from 11,253.90 Gg CO_2 eq in 1990 to 31,254.60 Gg CO_2 eq in 2018) since 1990.

Table 1
Greenhouse gas emissions by gas of Guatemala for 2018

Gas	*GHG emissions (Gg CO_2 eq) including LULUCF*	*% change 1990–2018*	*GHG emissions (Gg CO_2 eq) excluding LULUCF*	*% change 1990–2018*
CO_2	50 101.90	37.2	19 588.90	279.7
CH_4	8 328.40	70.4	8 112.90	73.7
N_2O	2 914.70	94.4	2 839.20	99.4
HFCs	713.60	NA	713.60	NA
PFCs	NO	NA	NO	NA
SF_6	NE	NA	NE	NA
Other	NO	NA	NO	NA
Total	**62 058.60**	**44.6**	**31 254.60**	**177.7**

30. Information on other emissions was reported, including 90.80 Gg NO_X, 1,699.40 Gg CO, 191.40 Gg NMVOCs and 50.60 Gg sulfur dioxide.

31. However, the information on these other emissions was reported as total emissions only, that is without disaggregation by sector, in Guatemala's BUR. During the technical

[2] https://unfccc.int/BURs.

analysis, the Party clarified that estimates by category had been made but owing to time constraints they were not reported in a disaggregated manner in the summary tables.

32. Information on CO_2, CH_4 and N_2O emissions for some categories was not reported owing to lack of information and AD, as clarified by the Party in its BUR. CO_2, CH_4 and N_2O emissions were not estimated for solid fuel manufacturing and other energy industries (category 1.A.1.c), other categories of fuel combustion (1.A.5), fugitive emissions from natural gas (1.B.2.b) and waste incineration (5.C.1); CH_4 and N_2O emissions were not estimated for anaerobic digestion in biogas facilities (5.B.2); CO_2 emissions were not estimated for process emissions from lead production (2.C.5); and N_2O emissions were not estimated for process emissions from N_2O of product uses (2.G.3), mineralization of soil organic matter (3.D.1.e), cultivation of organic soils (3.D.1.f) and industrial wastewater (5.D.2). Concerning fluorinated gases, SF_6 emissions were not estimated owing to lack of data. The TTE noted that emissions of HFCs were not reported on a gas-by-gas basis. During the technical analysis, the Party confirmed that it faces challenges in developing new data-collection systems and using proxies and splicing techniques to improve the completeness of the GHG inventory for the categories that are significant. The Party also confirmed that it faces challenges in establishing robust institutional arrangements for data provision and QA of the GHG inventory.

33. Guatemala 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.

34. The TTE noted that "NO" was reported for charcoal production (category 1.B.1) although charcoal is widely used in the country, which suggests that the activity occurs. During the technical analysis, the Party explained that it reported "NO" because there are no methodologies in the 2006 IPCC Guidelines for estimating emissions from charcoal production, but that it will assess the possibility of using the 2019 Refinement to the 2006 IPCC Guidelines for this category in future reporting.

35. Guatemala 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. GHG emissions for all land categories are accounted for and reported, but only for the above- and below-ground biomass pools. Guatemala clarified in its BUR that emissions for the other carbon pools (deadwood, litter and soil organic matter) and harvested wood products were not estimated owing to lack of specific information and AD.

36. The shares of emissions that different sectors contributed to the Party's total GHG emissions including LULUCF, as reported by the Party, in 2018 are reflected in table 2.

Table 2
Shares of greenhouse gas emissions by sector of Guatemala for 2018

Sector	*GHG emissions (Gg CO_2 eq)*	*% share*	*% change 1990–2018*
Energy	20 958.10	33.8	278.3
IPPU	1 992.80	3.2	248.8
Agriculture	6 552.90	10.6	45.1
LULUCF	30 804.00	49.6	–2.7
Waste	1 750.80	2.8	179.1

37. Guatemala reported information on its use of GWP values consistent with those provided by the IPCC in its AR4 based on the effects over a 100-year time-horizon of GHGs.

38. For the energy sector, information was reported on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories, notation keys and other information specific to the sector. In 2018, the energy sector accounted for the largest share of the total national emissions excluding LULUCF (67.1 per cent), whereas it was the second largest source of emissions including LULUCF (33.8 per cent). The subcategories that contributed the most to the sectoral emissions were transport (42.7 per cent), energy industries (26.9 per

cent), other sectors (16.6 per cent) and manufacturing industries and construction (9.3 per cent). CO_2 accounted for the largest share of the sectoral emissions by gas (86.4 per cent), followed by CH_4 (10.9 per cent) and N_2O (2.8 per cent). The sectoral emissions increased by 278.3 per cent in 1990–2018 and by 65.5 per cent in 2005–2018, owing mainly to a continuous increase in fossil fuel consumption for road transportation and electricity generation. The main sources of AD were the energy balance and the petroleum balance, both of which were obtained from sales statistics compiled by the Ministry of Energy and Mines.

39. For the IPPU sector, information was reported on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories, notation keys and other information specific to the sector. The IPPU sector accounted for 3.2 and 6.4 per cent of the total national GHG emissions including and excluding LULUCF respectively in 2018. Emissions from the sector increased by 248.8 per cent in 1990–2018 and by 100.8 per cent in 2005–2018, owing to an increase in activity in the mineral industry and a significant increase in consumption of HFCs for refrigeration and air conditioning. The subcategory that contributed the largest share of the sectoral emissions was mineral industry (61.4 per cent), followed by consumption of fluorinated gases (35.8 per cent) and non-energy products and solvent use (1.6 per cent). The largest shares of the sectoral emissions by gas in 2018 were CO_2 (64.2 per cent) and HFCs (35.8 per cent). Most of the AD used for estimating emissions from the IPPU sector were derived from statistics on production and imports and exports for the industry categories. Guatemala estimated emissions for all categories using the tier 1 methodology from the 2006 IPCC Guidelines, except for cement production for which it used the tier 2 methodology.

40. For the agriculture sector, enteric fermentation (CH_4) and agricultural soils (N_2O) were identified as key categories and the most relevant emissions sources in the sector. Guatemala used the tier 1 methodology and default EFs from the 2006 IPCC Guidelines to calculate GHG emissions for the agriculture sector, although the Party used default EFs from the 2019 Refinement to the 2006 IPCC Guidelines for some categories (such as enteric fermentation and rice cultivation). The Party mainly used AD from national statistics, primarily derived from the national agricultural censuses, and data from the national rice and coffee associations. Where national data were unavailable, Guatemala used AD from FAOSTAT. GHG emissions from the agriculture sector accounted for 10.6 and 21.0 per cent of the total national emissions including and excluding LULUCF respectively in 2018. The sectoral emissions increased by 45.1 per cent in 1990–2018 and by 13.9 per cent in 2005–2018, owing to increases in animal population and biomass burning in savannahs. The sectoral emissions by gas in 2018 were made up of CH_4 (69.9 per cent), N_2O (29.5 per cent) and CO_2 (0.6 per cent).

41. For the LULUCF sector, Guatemala reported annual GHG emissions and removals for 1990–2018. Overall, the net emissions from the LULUCF sector fluctuated between a minimum of 29,600.10 Gg CO_2 eq in 2010 and a maximum of 33,003.80 Gg CO_2 eq in 2005. The LULUCF sector accounted for the largest share (49.6 per cent) of the total national GHG emissions in 2018. The sectoral emissions came from forest land (53.0 per cent), pastureland (33.7 per cent), cropland (11.3 per cent), other land (1.1 per cent) and wetlands and settlements (1.0 per cent each). Guatemala used the tier 1 and 2 methodologies from the 2006 IPCC Guidelines for estimating emissions from LULUCF. The main AD used for the LULUCF sector were derived from a land-use change study conducted by the Inter-agency Mapping Group on Forests and Other Land Uses, national maps for forest cover, and national and international databases on timber and fuelwood harvesting and forest fires.

42. The TTE noted that the AD for land use and land-use change for 2017–2018 were estimated by extrapolating data obtained between 2006 and 2016 and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that it faces challenges in updating the maps used for elaborating the inventories, because it has data for only up until 2016. However, the Party is considering generating these essential data concurrently with the development of each inventory, as part of its inventory improvement plan.

43. For the waste sector, information was reported on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories, notation keys and other information specific to the sector. The waste sector contributed 2.2 and 5.6 per cent of the national GHG emissions including and excluding LULUCF respectively in 2018. The subcategories that

contributed most of the sectoral emissions were solid waste disposal (51.7 per cent), open burning of waste (22.4 per cent) and wastewater treatment (21.1 per cent). GHG emissions from the waste sector increased by 179.1 per cent in 1990–2018 and by 63.8 per cent in 2005–2018, owing to population growth. The main sources of AD were national surveys of people's living conditions and national census data.

44. The NIR provides an update to all GHG inventories reported in the Party's previous NCs. The information reported provides an update of the Party's NC3, which addresses anthropogenic emissions and removals for 1990–2016. The update was carried out for 1990–2016 using methodologies contained in the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines, thus generating a consistent 29-year time series.

45. Guatemala described in its BUR the institutional framework for the preparation and approval of its 2018 GHG inventory. The Party reported that the Ministry of Environment and Natural Resources is the governmental body responsible for its climate change policy and the GHG inventories, which were prepared with the support of specific bodies under the Directorate of Climate Change, such as the Department of Science and Metrics, the International Cooperation Unit and the Environmental and Climate Information Unit. In addition, six interministerial technical committees gather information on mitigation activities and for the GHG inventory. These institutional arrangements were initiated in 2021 and the preparation of the GHG inventory presented in the BUR is considered a pilot project. During the technical analysis, the Party confirmed that it still faces challenges in improving the time series of the AD, in terms of both data provision and QA.

46. Guatemala clearly reported that a key category analysis was performed for the level of and trend in emissions. The three key categories for the level of emissions (including LULUCF) for 2018 were CO_2 emissions from forest land remaining forest land (4.A.1), forest land converted to pastureland (4.C.2.a) and road transportation (1.A.3.b). For the trend in emissions (including LULUCF) for 1990–2018, the three key categories were CO_2 from grassland converted to forest land (4.A.2.b), forest land converted to pastureland (4.C.2.a) and road transportation (1.A.3.b). During the technical analysis, the Party clarified that it intends to identify, plan and prioritize improvements to the GHG inventory by involving all relevant institutions, taking into account the results of the key category analysis and using a more detailed level of disaggregation in accordance with the 2006 IPCC Guidelines.

47. The BUR provides information on QA/QC measures for all sectors. The information reported includes a description of the QC procedures, one of which is a final review of the GHG inventories by the National Committee of Climate Change. The main approaches used are the sectoral and reference approaches for the energy sector; comparing the emission estimations for the agriculture and LULUCF sectors against estimations from FAOSTAT; and comparing emission estimations for domestic wastewater measured in terms of per capita protein consumption against estimations from FAOSTAT. The Party has addressed concerns regarding preservation of information, previous studies and documentation by strengthening its national GHG information system. The Party has introduced several improvements in the information reported compared with the GHG inventory presented in previous NCs, such as including the reference approach for the energy sector; using the tier 2 methodology for estimating emissions from cement production in the IPPU sector; using EFs from the 2019 Refinement to the 2006 IPCC Guidelines and estimating emissions from urea use in the agriculture sector; including forest fires and additional information on cropland, grassland, wetlands, settlements and other land in the reporting for the LULUCF sector; and using the first-order decay method and new data sources for estimating emissions from solid waste disposal, biological treatment of solid waste and wastewater treatment in the waste sector. The TTE commends the Party for reporting information on QA/QC measures.

48. Guatemala 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 the reference approach are 18,100.90 and 18,596.30 kt CO_2 respectively. The difference between the estimates calculated using the two approaches was reported as 2.7 per cent for 2018.

49. Information was clearly reported on international aviation and noted as a memo item.

50. Information on marine bunker fuels and associated GHG emissions was not quantified or reported in the BUR owing to lack of disaggregated information, as clarified by the Party in its BUR. Guatemala indicated that emissions from marine bunker fuels are included under road transport, railroads and river navigation.

51. Guatemala reported information on the uncertainty assessment (level and trend) of its national GHG inventory. The uncertainty analysis was based on the tier 1 approach (error propagation method contained in the 2006 IPCC Guidelines) and covers all source categories and all direct GHGs. The results obtained, as reported in the BUR, reveal that the level uncertainty for emissions is 21.0 per cent (including LULUCF) for 2018 and the trend uncertainty is 32.2 per cent (including LULUCF) for 1990–2018.

52. The TTE noted that the transparency of the information reported on GHG inventories could be further enhanced by addressing the areas noted in paragraphs 25, 31, 34 and 42 above, which could facilitate a better understanding of the information reported on GHG inventories.

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

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

54. The information reported provides a clear overview of the Party's mitigation actions and their effects. In its BUR, Guatemala reported information on its national context and framed its national mitigation planning and actions in the context of the National Development Plan 2032, which is aimed at minimizing the country's per capita GHG emissions; the PANCC, which was updated in 2018 to reflect the NDC targets; the LT-LEDS, which prioritizes cost-effective emission reduction actions for the sectors included in the NDC; and the national REDD+ strategy (2020–2050), which was approved in 2021. Most of the mitigation actions are in the energy and LULUCF sectors.

55. The Party reported information on its NDC targets for 2030, such as reducing emissions by 11.2 per cent compared with the 2005 level under a 'business as usual' scenario and increasing the amount of technical and financial support received from the international community by 22.6 per cent compared with the 2005 level. The sectors with the greatest need for support for implementing the actions to achieve the NDC targets are forestry, agriculture and transport. The TTE acknowledged the information, which is presented in this summary report as contextual without assessing the completeness and transparency of the information.

56. The Party reported a summary of its 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.

57. The Party classified most of the mitigation actions as key mitigation policies and measures or NAMAs. The key mitigation policies and measures are the NDC, the LT-LEDS, the PANCC, the National Energy Plan 2017–2032, the National Energy Efficiency Plan 2019–2032, the National Cattle Policy, the national strategy for sustainable low-emission cattle ranching and the national REDD+ strategy.

58. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Guatemala reported the names of mitigation actions, coverage (sector and gases) and progress indicators in the BUR (section 3.2).

59. Information on some of the quantitative goals and progress indicators of the National Energy Plan 2017–2032 was not clearly reported. Furthermore, the Party reported that the share of renewable energy in the energy mix was 73 per cent in 2016 while the quantitative goal was 64 per cent in 2032 and it was not clear to the TTE why the goal would be to reduce the share. During the technical analysis, Guatemala clarified that the share of renewables in the energy mix was 58 per cent in 2016 (not 73 per cent as reported in table 3.5 of the BUR). Moreover, information on the goals of the National Energy Efficiency Plan 2019–2032 and the action "Increased absorptions by afforestation" was not clearly reported in the BUR. During the technical analysis, Guatemala clarified that the National Energy Efficiency Plan

2019–2032 has a target of reducing emissions by 29.2 per cent by 2032, and that the 2050 quantitative target for afforestation is 881.64 Gg CO_2 eq. Finally, the relationship between the sustainable low-emission cattle ranching NAMA and the National Cattle Policy and the national strategy for sustainable low-emission cattle ranching was not clearly reported in Guatemala's BUR. During the technical analysis, the Party clarified that these are two different actions: the National Cattle Policy and the related strategy are under implementation, while implementation of the NAMA has not yet begun but it will complement the implementation and progress of the strategy.

60. Guatemala reported information on methodologies and assumptions, the objectives of the actions and steps taken or envisaged to achieve those actions, progress of implementation and results expected for most of the reported mitigation actions.

61. The mitigation actions under the NDC and the LT-LEDS focus mainly on increasing the use of renewable energy sources and improving energy efficiency, using clean energy in transport, and reducing deforestation and forest degradation. These mitigation actions were reported as under implementation. The Party reported that to date no official and comprehensive estimate has been made of the impacts of the mitigation actions under the NDC and that monitoring and follow-up for these actions under implementation will be achieved through the national climate change information system, which is being enhanced. The 43 mitigation actions under the LT-LEDS covering the energy, transport, industry, LULUCF, agriculture and waste sectors were mostly reported as planned, with a few being reported as under implementation; however, as for the NDC actions, impact estimations for the implemented actions will be carried out through the national climate change information system.

62. The mitigation actions under the PANCC focus mainly on using renewable energy sources, promoting energy efficiency technologies, improving public transport systems, promoting efficient use of firewood and raising awareness about energy efficiency. The PANCC, which encompasses several programmes on energy efficiency, including developing fiscal incentives, tax incentives and subsidies for clean energy use, is part of the implementation of the NDC. For this reason, as explained in the BUR, the Party did not present the expected results of the mitigation actions under the PANCC.

63. The National Energy Plan 2017–2032, which is under implementation, focuses mainly on diversifying the country's energy mix as well as promoting efficient use of energy in the residential, commercial and public sectors. The Party reported that so far no specific monitoring has been carried out to assess the effectiveness of the actions included in the Plan; however, the Party reported that it estimated emission reductions amounting to approximately 4,910 Gg CO_2 eq by 2032 compared with the 'business as usual' scenario would be realized by implementing the Plan. The National Energy Efficiency Plan 2019–2032 focuses mainly on promoting energy efficiency certification, energy audits, the energy service company model, use of public transport, labelling of energy-efficient products and the replacement of cookstoves that use wood or liquefied petroleum gas with appliances that run on electricity. To date, no specific monitoring has been carried out to assess implementation and effectiveness; however, Guatemala reported that successful implementation of the Plan could reduce energy use by 69,790 TJ by 2032.

64. The National Cattle Policy is aimed at boosting the value chains of the meat and dairy industries, while the national strategy for sustainable low-emission cattle ranching is the instrument for implementing the policy, which is why Guatemala presented information on both in one table in the BUR. The mitigation actions focus mainly on promoting the establishment of improved pastures and their sustainable management, enhancing carbon dioxide capture and storage through implementation of silvopastoral systems by livestock farmers, and promoting the formation of value chains and certification of farms and products. The actions were reported as planned for implementation, and the Party stated that it has not yet developed a specific monitoring system for assessing the effectiveness of the Policy and strategy. The Party reported that if the Policy and strategy are implemented effectively, the carbon footprint of milk could be reduced from 5.8 to 2.4 kg CO_2 eq/kg milk and the carbon footprint of meat could be reduced from 16.5 to 8.7 kg CO_2/kg meat by 2033.

65. The national REDD+ strategy is focused mainly on reducing the conversion of forests to agricultural land, promoting sustainable forest management and expanding agroforestry coverage, and it is reported as under implementation. Guatemala reported that no overall assessment has yet been made regarding the potential emission reductions that implementation may achieve; however, the Party reported that the total emission reduction potential is 238,605 Gg CO_2 eq during 2020–2050 (176,262 Gg CO_2 eq from avoided deforestation, 37,544 Gg CO_2 eq from avoided degradation, 23,916 Gg CO_2 eq from restoration and 881.64 Gg CO_2 eq from afforestation).

66. Guatemala reported on four NAMAs that focus on promoting efficient use of firewood and alternative fuels in Indigenous and rural communities, sustainable low-emission cattle ranching, efficient and low-carbon forestry and agroforestry value chains, and sustainable management of forest landscapes. Guatemala reported that the four NAMA proposals were submitted to the NAMA Facility for approval and funding, and one of them (efficient use of firewood) has been approved for implementation. The Party reported the results of implementing the mitigation actions in the form of estimated emission reductions for the four NAMAs as well as reporting mitigation co-benefits for some of them (such as increased employment in rural areas, increased agricultural income and increased competitiveness regarding access to international markets). The mitigation potential of the NAMA on efficient use of firewood is estimated to be 1,300 Gg CO_2 eq at the end of the fifth year following its implementation with a further 7,100 Gg CO_2 eq by the tenth year. Implementing the NAMA on sustainable cattle ranching is expected to avoid 153.0 Gg CO_2 eq emissions and achieve 9.3 Gg CO_2 eq removals. Guatemala reported that the aim of the NAMA on low-carbon forestry and agroforestry is to reduce emissions by 1,764.7 Gg CO_2 eq during the project implementation period and 16,764.6 Gg CO_2 eq in the following 10 years. Successful implementation of the NAMA on sustainable forest landscapes would reduce emissions by an estimated 1,082 Gg CO_2 eq by the end of the project.

67. Information on the methodologies and assumptions used for estimating the GHG emission reductions associated with mitigation actions under the sustainable management of forest landscape NAMA was not reported. Furthermore, information reported on the methodologies and assumptions used was not clear enough to enable the TTE to understand the estimation of emission reductions for some actions, including those under the NDC, the LT-LEDS, the National Energy Plan 2017–2032, the national REDD+ strategy, the National Cattle Policy and the national strategy for sustainable low-emission cattle ranching, as well as some of the NAMAs. During the technical analysis, Guatemala clarified that it faces challenges in reporting information on methodologies and assumptions used for mitigation actions in general, but that it is working on generating such information for inclusion in future reports.

68. Information on the steps taken or envisaged to achieve some mitigation actions, including those under the NDC, the LT-LEDS, the PANCC, the National Energy Plan 2017–2032 and the National Energy Efficiency Plan 2019–2032, was not reported and the reason for this was not clear to the TTE. During the technical analysis, Guatemala clarified that it faces challenges in monitoring the implementation of various policies and strategies. Guatemala also clarified that it has been working on the NDC implementation plan, and that the steps envisaged for implementing the LT-LEDS are closely related to those for implementing the NDC. Guatemala is working on generating such information for inclusion in future reports.

69. Information on the progress of implementation was not reported for mitigation actions under the National Cattle Policy and the national strategy for sustainable low-emission cattle ranching. Similarly, the Party did not report information on progress of implementation of the underlying steps taken or envisaged for mitigation actions under the NDC, the LT-LEDS, the PANCC, the National Energy Plan 2017–2032 and the National Energy Efficiency Plan 2019–2032. Guatemala also did not report results achieved under the PANCC. During the technical analysis, Guatemala clarified that it faces challenges in monitoring and evaluating the impacts of various policies and strategies, but that it is working on generating such information for inclusion in future reports.

70. Guatemala provided information on its involvement in international market mechanisms as a Party to the Kyoto Protocol. The Party documented 20 clean development

mechanism projects approved by its designated national authority and registered under the UNFCCC clean development mechanism process, as well as 2 projects for which approval has been granted but which are not yet registered under the mechanism. The Party also documented 13 projects registered under the voluntary carbon market process between 2005 and 2014. The reported information includes the name of each measure as well as a description, sector, GHGs covered, duration, quantified objectives, methodology and auditor. During the technical analysis, Guatemala clarified that it is evaluating the prospect of participating in the carbon market mechanism under Article 6 of the Paris Agreement.

71. Guatemala reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that under the national climate change information system a national GHG inventory system has been set up for monitoring and reporting mitigation actions. In addition, the Party is preparing to implement a project entitled "Strengthening the transparency framework by building national capacities to implement the Paris Agreement in Guatemala", which will include monitoring more accurately the NDC measures in order to comply with the ETF. Guatemala outlined the processes planned for improving its domestic MRV arrangements, which include strengthening partnerships and institutional arrangements, strengthening its technical capacity, building its financial capacity, implementing continuous process improvements and promoting broad-based community participation.

72. The TTE noted that the transparency of the information reported on mitigation actions could be enhanced by addressing the areas noted in paragraphs 59 and 67–69 above, which could facilitate a better understanding of the information reported on mitigation actions.

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

73. As indicated in table I.3, Guatemala 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.

74. Guatemala 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, Guatemala identified poverty, deforestation, environmental degradation, high population density, food insecurity and lack of climate data and information for decision-making as constraints. Guatemala reported that its financial, technical and capacity-building needs are primarily in the areas of generating and managing climate data and information for decision-making and reporting; educating, raising awareness among and building the capacity of all stakeholders regarding climate change issues; mainstreaming climate change in national policies, plans and strategies; obtaining funding to implement the PANCC and other policy instruments; facilitating development and transfer of technology for adaptation and mitigation; and considering gender and the needs of Indigenous Peoples and vulnerable people in climate change activities.

75. Information on capacity-building and technical needs was not reported separately in Guatemala's BUR; rather, it was reported in a consolidated format. The TTE therefore faced challenges in understanding the specific activities for which capacity-building and/or technical assistance are needed. During the technical analysis, the Party clarified that it intends to provide clear and specific information in future reports.

76. Guatemala reported information on financial resources, capacity-building and technical support received in accordance with decision 2/CP.17, annex III, paragraph 15. In its BUR, Guatemala reported that it received USD 852,000 from the GEF, which included allocation for preparing both its first BUR and its NC3. The Party reported that it received financial support amounting to USD 332 million from UNFCCC Financial Mechanism entities and other international sources between 2015 and 2020, including USD 27 million from the GEF, USD 108 million from the GCF and USD 5 million from the Adaptation Fund. The information reported indicates that Guatemala received capacity-building and technical support from the United Nations Development Programme to facilitate its use of the 2006 IPCC Guidelines for preparing its GHG inventory. The Party also received technical and

capacity-building support from various international agencies for implementing adaptation and mitigation actions, monitoring climate data and developing the MRV system.

77. Guatemala reported information on nationally determined technology needs with regard to the development and transfer of technology in accordance with decision 2/CP.17, annex III, paragraph 16. In its BUR, the Party reported that its technology needs are primarily in the areas of implementing innovative adaptation and mitigation practices, developing pilot projects in prioritized communities and monitoring their impacts, improving data-collection processes, developing and acquiring data-processing software, creating data centres and digitizing historical data, improving physical infrastructure for adaptation and mitigation measures, and improving the operational processes of institutions.

78. In its BUR, Guatemala reported that its technology needs assessment was nationally determined but it did not elaborate on the process for the assessment. Furthermore, the Party provided general information on the technology support received but did not report specific information on technology support received in several sectors. During the technical analysis, the Party clarified that its MRV system is being developed, leading to challenges in collecting and reporting the necessary information on technology needs assessment and support received. Guatemala further clarified that it intends to provide clear and specific information in future reports.

79. 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 75 and 78 above, which could facilitate a better understanding of the information reported on needs and support received.

D. Identification of capacity-building needs

80. In consultation with Guatemala, the TTE identified the following needs for capacity-building that could facilitate the preparation of subsequent BURs, participation in ICA and transition to the ETF:

(a) Building national capacity to prepare and submit national reports in a timely manner under the Convention and the Paris Agreement;

(b) Enhancing national capacity to establish the required institutional arrangements for data provision and QA of the GHG inventory;

(c) Enhancing national capacity to improve the completeness of the GHG inventory (e.g. by developing new data-collection systems, improving the quality of AD available, and using proxies and splicing techniques);

(d) Implementing training on GHG inventory compilation for national experts and institutions;

(e) Enhancing national capacity to use the 2019 Refinement to the 2006 IPCC Guidelines for estimating fugitive emissions in the energy sector;

(f) Building national capacity to generate land-use maps to increase the availability of AD for estimating recent emissions and removals from the LULUCF sector;

(g) Enhancing national capacity to elaborate both qualitative and quantitative key category analyses at a disaggregated level and for interpreting and using the key category analyses and the uncertainty analysis to prioritize efforts within GHG inventory compilation;

(h) Enhancing national capacity to identify, plan and prioritize improvements to the GHG inventory;

(i) Enhancing national capacity for modelling national and sectoral mitigation actions and options;

(j) Enhancing the capacity of the various bodies implementing mitigation actions regarding the selection and application of the corresponding calculation methodologies to enable accurate estimation of the emission reductions generated;

(k) Enhancing national capacity to identify and report on the assumptions used for estimating the emission reductions resulting from the various mitigation actions;

(l) Enhancing national capacity to create a specific timetable for each of the MRV activities in relation to the various UNFCCC submissions (e.g. institutional arrangements and a workplan with deadlines for receiving information from the various entities, deadlines for receiving comments from the ministries on the reports before submission);

(m) Enhancing the capacity of organizations implementing the mitigation actions to develop a monitoring plan for each action and to use the national climate change information system effectively;

(n) Enhancing national capacity to report on the progress of implementation of national policies and action plans;

(o) Enhancing national capacity to estimate the emission reduction potential of mitigation actions and options in preparation for the ETF;

(p) Enhancing national capacity to enable the country's effective participation in activities under Article 6 of the Paris Agreement;

(q) Enhancing the national MRV system to facilitate compiling and reporting information on the technology needs assessment conducted following a nationally determined process;

(r) Enhancing national capacity to compile and report information on technology, capacity-building and technical support received in a disaggregated manner.

81. The TTE noted that, in addition to those identified during the technical analysis, Guatemala reported several capacity-building needs covering the following areas:

(a) GHG inventory preparation;

(b) Climate data and information management systems;

(c) Adaptation and vulnerability assessment;

(d) Assessment of mitigation and adaptation actions;

(e) Climate finance mobilization;

(f) Institutional arrangements for addressing climate change issues.

III. Conclusions

82. The TTE conducted a technical analysis of the information reported in the first BUR of Guatemala 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 an NIR; 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; domestic MRV; and other information relevant to the achievement of the objective of the Convention. During the technical analysis, additional information was provided by Guatemala on mitigation actions and their effects. The TTE concluded that the information analysed is mostly transparent.

83. Guatemala reported information on the institutional arrangements relevant to the preparation of its BURs. The Department of Science and Metrics of the Directorate of Climate Change is responsible for the preparation of NCs and BURs with the assistance of other government agencies and committees that are responsible for providing recommendations on adaptation and mitigation measures. Guatemala has taken significant steps towards establishing institutional arrangements that enable sustainable preparation of

its BURs, and it plans to make organizational improvements and establish knowledge-sharing procedures to facilitate sectoral information transfer.

84. In its first BUR, submitted in 2023, Guatemala reported information on its national GHG inventory for 1990–2018. This included GHG emissions and removals of CO_2, CH_4, N_2O and HFCs for most relevant sources and sinks as well as aggregated estimates of emissions of precursor gases. The inventory was developed on the basis of the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines. The total GHG emissions for 2018 were reported as 31,254.60 Gg CO_2 eq (excluding LULUCF) and 62,058.60 Gg CO_2 eq (including LULUCF). For the level of emissions in 2018 including LULUCF, the three key categories were CO_2 emissions from forest land remaining forest land (4.A.1), forest land converted to pastureland (4.C.2.a) and road transportation (1.A.3.b). For the trend in emissions (1990–2018) including LULUCF, the three key categories were CO_2 emissions from grassland converted to forest land (4.A.2.b), forest land converted to pastureland (4.C.2.a) and road transportation (1.A.3.b). As clarified by the Party in the BUR, it did not report emissions of CO_2 for some categories (i.e. those under 1.A, 1.B, 2.C, 3.G, 4.C, 4.D, 4.E, 4.F and 5.C) owing to difficulties in obtaining the necessary data; for the same reason it did not report emissions of CH_4 for some categories (i.e. those under 1.A, 1.B, 3.A, 3.B, 4.B, 4.C, 5.B and 5.C) and N_2O for some categories (i.e. those under 1.A, 1.B, 2.G, 3.B, 3.D, 3.F, 4.B, 4.C, 5.B, 5.C and 5.D).

85. Guatemala reported information on mitigation actions and their effects in both tabular and narrative format and framed its national mitigation planning and actions in the context of the National Development Plan 2032 and the PANCC. Guatemala reported planned and ongoing actions, most of which are in the energy and LULUCF sectors. The mitigation actions focus on enhancing renewable energy sources, promoting the efficient use of energy generally and firewood specifically, reducing deforestation and forest degradation, and expanding agroforestry coverage. The highest emission reduction was reported for the national REDD+ strategy (2020–2050) in the LULUCF sector, accounting for cumulative estimated removals of 238,605 Gg CO_2 eq by 2050. Guatemala reported actions with mitigation co-benefits, including increased employment in rural areas, increased agricultural income and increased competitiveness regarding access to international markets. The Party also reported information on its involvement in international market mechanisms and on MRV arrangements. Information on methodologies and assumptions used for estimating the impacts of various mitigation actions was not provided owing to capacity challenges, as clarified by the Party during the technical analysis. Moreover, monitoring the progress of implementation and emission reductions of the ongoing projects in addition to the estimated emission reductions of the planned ones was not clearly reported owing to data-collection and capacity challenges, as clarified by Guatemala during the technical analysis.

86. Guatemala reported information on key constraints, gaps and related needs, including poverty, environmental degradation and lack of climate data and information. Information was reported on technical and capacity-building support received, including support received from various international agencies for adaptation, mitigation, monitoring of climate data, and the MRV system. The Party reported that it received financial support of USD 332 million from various international agencies between 2015 and 2020. Guatemala also reported that it received financial support amounting to USD 852,000 from the GEF for preparing its first BUR and NC3. Clear and specific information on technical, capacity-building and technology support needed and received was not reported owing to challenges in collecting and reporting the necessary information, as clarified by the Party during the technical analysis.

87. The TTE, in consultation with Guatemala, identified the 18 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 two needs for capacity-building to facilitate transition to the ETF listed in paragraph 80(a) and (o) above. Guatemala prioritized all the capacity-building needs.

Annex I

Extent of the information reported by Guatemala in its first biennial update report

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

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.	No	Guatemala submitted its first BUR in June 2023; the GHG inventories reported are for 1990–2018.
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	Guatemala used the 2006 IPCC Guidelines and the 2019 Refinement to 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	Guatemala submitted a technical annex to its first BUR, containing updated AD and EFs.
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	Comparable information was reported in table 6.1 of the technical annex.
	(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	A complete updated time series for 1990–2018 was reported in the BUR. The latest NC (NC3) covers 1990–2016.
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	Summary information was reported for 1994, 2000 and 2005.
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 greenhouse gas inventories), including:		

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	(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	Guatemala reported total emissions of other GHGs such as CO, NO_X, NMVOCs and sulfur dioxide; however, emissions of these gases were not reported disaggregated by sector in the summary tables.
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6).	Partly	Emissions of HFCs were not reported on a gas-by-gas basis.
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex.	Yes	Guatemala submitted an NIR as an annex to its 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	In its BUR (chap. 2, table 2-19), Guatemala provided a summary of the key category analysis (level and trend) using approaches 1 and 2 from the 2006 IPCC Guidelines.
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	Information on the procedures and institutional arrangements for collecting and archiving data is provided in the BUR.
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	Guatemala did not report emissions of CO_2 for some sources under categories 1.A, 1.B, 2.C, 3.G, 4.C, 4.D, 4.E, 4.F and 5.C.
	(b) CH_4;	Partly	Guatemala did not report emissions of CH_4 for some sources under categories 1.A, 1.B, 3.A, 3.B, 4.B, 4.C, 5.B and 5.C.
	(c) N_2O.	Partly	Guatemala did not report emissions of N_2O for some sources under categories 1.A, 1.B, 2.G, 3.B, 3.D, 3.F, 4.B, 4.C, 5.B, 5.C and 5.D.
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:	Yes	
	(a) HFCs;	Yes	
	(b) PFCs;	Yes	Guatemala did not estimate emissions of PFCs; however, the correct notation keys were used.
	(c) SF_6.	Yes	Guatemala did not estimate emissions of SF_6; however, the correct notation keys were used.

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 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emissions by sources of other GHGs, such as:		
	(a) CO;	Yes	Guatemala reported total emissions of CO; however, emissions disaggregated by category were not reported.
	(b) NO_X;	Yes	Guatemala reported total emissions of NO_X; however, emissions disaggregated by category were not reported.
	(c) NMVOCs.	Yes	Guatemala reported total emissions of NMVOCs; however, emissions disaggregated by category were not reported.
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	Guatemala reported total emissions of sulfur dioxide; however, emissions disaggregated by category were not reported.
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	The information was reported using both approaches.
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	Guatemala indicated that marine bunker fuels are included under road transport, railroads and river navigation. Marine bunker fuels are included in the national totals.
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.	NA	Guatemala used the GWP provided in the AR4.
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		

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	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	Guatemala used the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines. A tier 1 method was used for estimating most categories across all sectors, except for cement production under the IPPU sector and some categories under the LULUCF sector, for which a tier 2 method was used. The BUR (annex 3, table A3.1) contains a summary of the methods used for estimating emissions and removals.
	(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:	NA	
	(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	Guatemala reported comparable information on its national GHG inventory in the BUR (chap. 2, table 2-5) on a gas-by-gas basis for CO_2, CH_4 and N_2O and notation keys were used in the table. However, emissions of HFCs were not reported on a gas-by-gas basis.
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:		
	(a) Level of uncertainty associated with inventory data;	Yes	The BUR contains information on the overall uncertainty of the inventory (chap. 2, section 2.5). Annex 2, table A.2.1, presents the uncertainty for 2018 and the trend for 1990–2018.

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	(b) Underlying assumptions;	Yes	Guatemala provided the assumptions associated with the uncertainty of the inventory data (AD and EFs) in the BUR (annex 2, table A.2.1).
	(c) Methodologies used, if any, for estimating these uncertainties.	Yes	Method 1 was used for error propagation for individual estimations by category.

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 first biennial update report of Guatemala

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	
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;	Yes	
	(b) Information on:		
	(i) Methodologies;	Partly	Guatemala provided information on methodologies for most of the mitigation actions; however, it did not report on methodologies used for the NAMA "GHG emission reductions through sustainable management of forest landscapes by vulnerable rural producers in Guatemala".
	(ii) Assumptions;	Partly	Guatemala provided information on assumptions for most of the mitigation actions; however, it did not report on assumptions used for the NAMA "GHG emission reductions through sustainable management of forest landscapes

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
			by vulnerable rural producers in Guatemala".
	(c) Information on:		
	(i) Objectives of the action;	Yes	
	(ii) Steps taken or envisaged to achieve that action;	Partly	Guatemala provided information on steps taken or envisaged to achieve most of the mitigation actions; however, it did not report such information for mitigation actions under the NDC, the LT-LEDS, the PANCC or the National Energy Plan 2017–2032.
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Partly	Guatemala provided information on progress of implementation of most of the mitigation actions; however, it did not report such information for mitigation actions under the National Cattle Policy and the national strategy for sustainable low-emission cattle ranching.
	(ii) Progress of implementation of the underlying steps taken or envisaged;	Partly	Guatemala provided such information for most of the mitigation actions; however, it did not report such information for mitigation actions under the NDC the LT- LEDS, the PANCC, the National Energy Plan 2017–2032 or the National Energy Efficiency Plan 2019–2032.
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Partly	Guatemala provided information on the results of some actions but not others. For example, the Party reported that there has been no evaluation of the goals achieved under the implementation of the PANCC.
	(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 first biennial update report of Guatemala

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, technology transfer and capacity-building 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;	Partly	Guatemala reported information on financial, capacity-building and technical support received from various supporting agencies to undertake climate change activities. However, specific information on support received for technology transfer and development was not reported.
	(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	Guatemala provided information on some of its technology needs; however, it was not clear how these were determined following a national process.
	(b) Technology support received.	Partly	Guatemala provided general information on technology support received; however, it did not report on specific technology support received in several sectors.

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.

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

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

B. UNFCCC documents

First BUR of Guatemala. Available at https://unfccc.int/BURs.

NC1, 2 and 3 of Guatemala. Available at https://unfccc.int/non-annex-I-NCs.