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Technical analysis of the third biennial update report of Colombia submitted on 14 January 2022

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 Colombia, 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
AFOLU	agriculture, forestry and other land use
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BUR	biennial update report
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
DANE	National Administrative Department of Statistics of Colombia
EF	emission factor
ETF	enhanced transparency framework under the Paris Agreement
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
HWP	harvested wood products
ICA	international consultation and analysis
IDEAM	Institute of Hydrology, Meteorology and Environmental Studies
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPCC good practice guidance for LULUCF	*Good Practice Guidance for Land Use, Land-Use Change and Forestry*
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
N_2O	nitrous oxide
NA	not applicable
NAMA	nationally appropriate mitigation action
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NIR	national inventory report
non-Annex I Party	Party not included in Annex I to the Convention
PFC	perfluorocarbon
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
SF_6	sulfur hexafluoride
TTE	team of technical experts
UNFCCC guidelines for the preparation of NCs from non-Annex I Parties	"Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention"
UNFCCC reporting guidelines on BURs	"UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention"

I. Introduction and process overview

A. Introduction

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

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

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

4. Colombia submitted its second BUR on 18 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, Colombia participated in the ninth workshop for the facilitative sharing of views, convened remotely on 26 November 2020.

5. This summary report presents the results of the technical analysis of the third BUR of Colombia, 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, Colombia submitted its third BUR on 14 January 2022 as a stand-alone update report. The submission was made within three years from the submission of the second BUR. During the technical analysis, the Party clarified that administrative delays resulted in the project to prepare its BUR not starting until December 2020. Colombia also clarified that it is planning to submit its first biennial transparency report by 2024.

7. The technical analysis of Colombia's BUR was conducted from 18 to 22 July 2022 in Santo Domingo 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: Kendal Blanco-Salas (Costa Rica), Luis Caceres Silva (former member of the Consultative Group of Experts from Ecuador), Remi D'Annunzio (France), Thiago de Araújo Mendes (former member of the Consultative Group of Experts from Brazil), Luis Alberto de la Torre (Peru), Maria Jose Lopez (Belgium), Lilian Portillo (former member of the Consultative Group of Experts from Paraguay), Rafael Pulgar (Brazil) and Orlando Ernesto Rey Santos (Cuba). Maria Jose Lopez and Orlando Ernesto Rey Santos were the co-leads. The technical analysis was coordinated by Veronica Colerio and Luca Birigazzi (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 Colombia 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 Colombia's third BUR, the TTE prepared and shared a draft summary report with

[1] The consultation was conducted via videoconferencing.

Colombia on 9 February 2023 for its review and comment. Colombia, in turn, provided its feedback on the draft summary report on 18 May 2023.

9. The TTE responded to and incorporated Colombia's comments referred to in paragraph 8 above and finalized the summary report in consultation with the Party on 7 July 2023.

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 Colombia's BUR outlined in paragraph 10 above.

B. Extent of the information reported

12. The elements of information referred to in paragraph 10(a)(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 12 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 Colombia's third BUR compared with that in its previous BUR. Information on the GHG inventory reported in the Party's third BUR demonstrates that it has taken into consideration the areas for enhancing the transparency of the extent of the information reported noted by the previous TTE in the summary report on the technical analysis of the Party's previous BUR.

C. Technical analysis of the information reported

15. 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.

16. 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. Colombia submitted an NIR as a stand-alone document and, further to consultations with the TTE, requested a more detailed analysis and documentation of the findings contained in the NIR to be undertaken using the agreed GHG inventory tool.

17. 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

18. 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.

19. In its third BUR, Colombia provided an update on its national circumstances, including a description of national and regional development priorities, objectives and circumstances, including features of geography, climate, biodiversity, demography and human development, 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, as referred to in Article 4, paragraph 8, and, as appropriate, Article 4, paragraphs 9–10, of the Convention.

20. In addition, Colombia provided a summary of relevant information regarding its national circumstances in tabular format.

21. Colombia reported in its third BUR an update 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, quality assurance/quality control procedures, and provisions for public consultation and other forms of stakeholder engagement. In July 2018 Colombia approved its Climate Change Law, which provided for the establishment of guidelines and instruments for managing climate change and promoting the transition to a competitive, sustainable economy and low-carbon development, as well as the national climate change information system.

22. An agency of the Ministry of Environment and Sustainable Development, IDEAM, is the entity responsible for the preparation of NCs and BURs. The implementing agency, the United Nations Development Programme, receives and manages Global Environment Facility resources and provides technical support. National and international cooperation agencies lead, review and endorse the results included in the reports submitted to the UNFCCC secretariat.

23. Information on the preparation of NCs on a continuous basis was not clearly reported in Colombia's BUR. During the technical analysis, the Party clarified that technical staff are engaged on a project-by-project basis, which has a negative effect on the continuity of the preparation and submission of national reports. Furthermore, IDEAM, which guides the process, requires additional sectoral staff to prepare the reports in a timely manner.

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

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

25. As indicated in table I.1, Colombia 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. Colombia submitted its third BUR in 2022 and the GHG inventory reported is for 1990–2018. The GHG inventory is consistent with the requirements for the reporting time frame.

27. Colombia submitted an NIR in conjunction with its third BUR and the document was made publicly available on the UNFCCC website.[2]

28. GHG emissions and removals for the BUR covering the 1990–2018 inventory were estimated using tier 1, 2 and 3 methodologies from the 2006 IPCC Guidelines, depending on the sector and category. Colombia clearly indicated in the NIR for each sector and category which tier was used. Colombia used tier 3 for the first time for some categories. The TTE commends the Party for the enhanced accuracy.

29. Information on AD and EFs used and their sources was clearly reported in the BUR for the energy, IPPU and waste sectors.

30. Information on the Party's total GHG emissions by gas for 1990–2018 is outlined in table 1 in Gg CO_2 eq. It shows an increase in emissions of 26.8 per cent including land and HWP since 1990 (220,257.00 Gg CO_2 eq).

Table 1
Greenhouse gas emissions by gas of Colombia for 1990–2018

Gas	*GHG emissions (Gg CO_2 eq) including land and HWP[a]*	*% change 1990–2018*	*GHG emissions (Gg CO_2 eq) excluding land and HWP[a]*	*% change 1990–2018*
CO_2	188 820.66	13.1	90 394.27	86.2
CH_4	73 631.22	65.6	73 586.22	65.6
N_2O	13 421.68	51.9	13 421.68	51.9
HFCs	3 145.72	NA	3 145.72	NA
PFCs	0.16	NA	0.16	NA
SF_6	179.18	326.6	179.18	326.6
Other	NA	NA	NA	NA
Total	**279 198.61**	**26.8**	**180 727.23**	**77.4**

[a] 2006 IPCC Guidelines AFOLU category 3.B (land) and, if reported, 3.D (HWP (3.D.1) and other emissions (3.D.2)).

31. Information on precursor gases was clearly reported for 2010–2018. Colombia reported the following emissions: 387.35 Gg nitrogen oxides; 1,806.93 Gg carbon monoxide; 686.62 Gg non-methane volatile organic compounds; 480.61 Gg sulfur dioxide; 214.2 Gg particulate matter under 10 µm in diameter; 179.87 Gg particulate matter under 2.5 µm in diameter; and 28 Gg black carbon.

32. Colombia 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. Detailed information on the use of notation keys is provided in paragraph 49 below.

33. Colombia 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.

[2] https://unfccc.int/documents/510821.

34. The shares of emissions that different sectors contributed to the Party's total GHG emissions excluding land and HWP (category 3.B and, if reported, 3.D), as reported by Colombia, in 2018 are reflected in table 2.

Table 2
Share of greenhouse gas emissions by sector of Colombia for 2018

Sector	*GHG emissions (Gg CO_2 eq)*	*% share*[a]	*% change 1990–2018*
Energy	92 939.78	51.5	84.7
IPPU	10 494.71	5.8	139.8
AFOLU	155 290.17	NA	–2.4
Livestock (category 3.A)	44 883.55	24.8	38.8
Land (category 3.B)	99 060.62	NA	–16.3
Aggregate sources and non-CO_2 emissions sources on land (category 3.C)	11 935.24	6.6	43.5
HWP and other emissions (category 3.D)	–589.24	NA	–1 400.2
Waste	20 473.95	11.3	212.8

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

35. Colombia reported information on its use of GWP values consistent with those provided by the IPCC in its AR5 based on the effects over a 100-year time-horizon of GHGs. The Party recalculated all years of the time series by updating the GWP values from the AR2 in its previous BUR to those from the AR5 in its NIR and third BUR. The TTE commends Colombia for enhancing the consistency of its reporting.

36. For the energy sector, for 2018 Colombia reported emissions from stationary combustion (energy industries, manufacturing industries and construction, and other sectors: commercial and institutional, residential and agriculture, forestry and fishing) and mobile combustion (transport), as well as fugitive emissions from solid and liquid fuels. In 1990–2018 GHG emissions for this sector increased owing to the increase in the use of fuels. Category 1.A.3 (transport) is the main source of emissions in this sector, contributing 42.7 per cent of sector emissions for 2018. Colombia estimated emissions using mostly tier 1 and 2 methodologies and using either IPCC default EFs or country-specific EFs. In general, the CO_2 emissions from stationary combustion were estimated using tier 2 methodology, except for emissions generated from consumption of refinery gas in category 1.A.1.b (oil refining), for which tier 1 methodology was used. Tier 2 EFs for CO_2 were developed within the framework of the Mechanism for Voluntary Mitigation of Greenhouse Gas Emissions in Colombia project.

37. Tier 3 methodology was applied for categories 1.A.3.e.ii (off-road – diesel consumption) and 1.A.4.c.ii (off-road vehicles and other machinery). The main source of AD for the energy sector is Colombia's national energy balance. Complementary sources of information include the fuels information system and the information system for public services.

38. Some energy sector categories were reported as "NE" for some years of the time series: category 1.A.1.c.ii.3 (manufacture of solid fuels and other energy industries – coal production) was reported as "NE" for 1990–2009; categories 1.A.2.i (mining and quarrying) and 1.A.2.k (construction) were reported as "NE" for 1990–2009; and category 1.A.1.a.i.2 (interconnected zone) was reported as "NE" for 1990–2007. These categories were estimated for the other years of the time series.

39. The Party did not clarify in its NIR or BUR how reporting "NE" for some categories for some years affects the consistency of the time series for the energy sector. During the technical analysis, the Party clarified that under category 1.A.1.a (public electricity and heat production) the reporting of estimated emissions for 1.A.1.a.i.2 (electricity generation) since 2007 has led to a rise in reported emissions for 1.A.1.a of less than 0.7 per cent (for 2007). Furthermore, the growth rate of emissions for 1.A.1.a.i.2 is similar to that observed for 1.A.1.a. Therefore, this estimate is not considered to affect time-series consistency.

40. Additionally, Colombia clarified that under category 1.A.1.c (manufacture of solid fuels and other energy industries) the reporting of estimated emissions for 1.A.1.c.ii.3 (oil and gas extraction) since 2010 has led to an increase in reported emissions for 1.A.1.c of 35 per cent on average. Although the growth rate of emissions for 1.A.1.c.ii.3 is similar to that observed for 1.A.1.c and does not cause a change in trend, the reporting of estimated emissions for 1.A.1.c.ii.3 affects the consistency of the entire category. Colombia also clarified that this observation will be included in the inventory improvement plan. The total influence of estimating emissions for category 1.A.2.i (mining and quarrying) on category 1.A.2 (manufacturing industries and construction) since 2010 corresponds to an increase of 0.75 per cent; therefore, it does not represent a significant variation for the 1990–2009 data series. Likewise, the growth rate of emissions under category 1.A.2.i has been stable in recent years. The influence of category 1.A.2.k (construction) on category 1.A.2 total emissions from 2010 onward corresponds to a 3.07 per cent increase; therefore, inclusion of 1.A.2.k for 1990–2009 is not considered to substantially affect time-series consistency. The Party further clarified that an improvement plan for categories 1.A.2.i and 1.A.2.k is detailed in NIR tables 7-4 and 7-5.

41. For the IPPU sector, the Party reported emissions for several categories, including 2.A (mineral industry), 2.B (chemical industry), 2.C (metal industry), 2.D (non-energy products from fuels and solvent use), 2.F (product uses as substitutes for ozone-depleting substances) and 2.G (other product manufacture and use). Category 2.A.1 (cement production) is the main source of emissions in this sector, contributing 40.8 per cent of the total sectoral emissions for 2018. Most of the information on AD was collected through the DANE annual manufacturing survey, with other national data sources for specific industries being consulted. The Party used tier 2 methods from the 2006 IPCC Guidelines to estimate emissions for categories 2.A.2 (lime production), 2.A.3 (glass production), 2.A.4 (other process uses of carbonates) and 2.A.4.b (other uses of soda ash), with tier 1 methods used for the other categories. The Party used a combination of IPCC default EFs and country-specific EFs accordingly. The TTE commends Colombia for its effort to include, for the first time, estimates of emissions from the use of PFCs in category 2.F.1 (refrigeration and air conditioning).

42. For some categories in the IPPU sector Colombia estimated emissions using different EFs for different periods. For example, for category 2.A.1 (cement production) an EF of 0.536 t CO_2/t clinker was used for 1990–2014 and a different EF (0.537 t CO_2/t clinker) was used for 2015–2018; for category 2.B.2 (nitric acid production) an EF of 7.5 kg N_2O/t nitric acid was used for 2010–2018 and the default EF from the 2006 IPCC Guidelines (9 kg N_2O/t nitric acid) was used for 1990–2009. During the technical analysis, the Party clarified that the decision to use different EFs was taken following a consultation process with the industry on the appropriate EF.

43. The TTE noted that, in its NIR, Colombia reported emissions for category 2.A.4 (other process uses of carbonates). During the technical analysis, the Party clarified that the carbonate accounted for soda ash (sodium carbonate). In addition, Colombia stated that the AD for this category are extracted from annex 6.2 to the DANE annual manufacturing survey.[3] However, the TTE noted that this annex does not contain explicit information on soda ash use but rather information on production and sales. The TTE also noted that the Party did not clarify in its NIR or BUR how the AD are extracted from the DANE survey and if CO_2 emissions are affected by whether all the carbonate produced and sold is used in a process (calcination of the carbonate). During the technical analysis, Colombia clarified that NIR table 4-8 contains an error regarding the source of AD for category 2.A.4. The AD used correspond to the consumption of soda ash (soda ash carbonate) in the country, the source of which is annex 6.1 to the DANE survey. The Party stated that it will include the correct reference in its next BUR and NIR and that it is working to extract the soda ash not calcinated from the data used.

44. For 2006 IPCC Guidelines AFOLU categories 3.A and 3.C, agricultural soils (N_2O) and enteric fermentation (CH_4) were identified as key categories and the most relevant

[3] See https://www.dane.gov.co/index.php/estadisticas-por-tema/industria/encuesta-anual-manufacturera-enam/eam-historicos (in Spanish).

emissions sources in the sector. Together, these categories represent 29.7 per cent of the total net emissions for the AFOLU sector. Emissions from livestock have been steadily increasing since 1990 (0.9 per cent per year).

45. Colombia used a tier 2 approach to estimate emissions, using a combination of EFs from the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines through a multi-model approach developed by IDEAM (model AFOLU 1 – Colombia). The reference to the document is not directly accessible from the BUR or the NIR but, during the technical analysis, Colombia provided the TTE with the source of the document as well as other supporting documents.

46. For land and HWP (categories 3.B and 3.D), Colombia reported annual GHG emissions and removals for 1990–2018. The majority of the emissions reported under these categories come from grassland and forest degradation, but the overall tendency is a decrease in net emissions. This is partly due to a steady increase in removals over 1990–2018 (406 per cent increase in removals, which represents a compound annual growth rate of 5.8 per cent).

47. Information on AD and EFs for the land category was clearly reported but the sources of the information were not clearly presented in Colombia's NIR or BUR. However, during the technical analysis, Colombia clarified that the forest inventory results came from the governing framework of the national forest inventory and provided the relevant link.[4] In addition, AD for land-use change from forest land were calculated by breaking down the deforestation statistics into forest land and other land-use type (the statistics are obtained from the forest and carbon monitoring system (known as 'SMByC') of IDEAM), but this information is not publicly available. For category 3.B.1.a.iii (forest land remaining forest land (commercial forest plantations)), AD for CO_2 emissions from biomass burning in plantation areas were obtained from the fire reports recorded by the regional autonomous corporations on the IDEAM national forest information system platform (known as 'SNIF'), which are supplied internally to IDEAM. Colombia indicated that it is improving the systematization of the information reported in the national forest information system[5] and expects that this information will be publicly available in the medium term.

48. For the waste sector, the main source of emissions is category 4.A.1 (managed waste disposal sites), contributing 49.7 per cent of sectoral emissions for 2018. The AD used include the amounts of solid waste disposed and domestic wastewater treated, from the Superintendency of Residential Public Services; the characterization of waste incinerated and the different technologies for industrial wastewater treatment, from IDEAM; population projections for Colombia between 1985 and 2020, from DANE; information on basic sanitation services, from the national quality of life survey; and industry sector information, from the annual manufacturing survey. Colombia used tier 2 methods from the 2006 IPCC Guidelines to estimate emissions for all categories except categories 4.D (wastewater treatment and discharge) and 4.C.2 (open burning of waste) (N_2O and CH_4). Category 4.B (biological treatment of solid waste) was reported as "NE" as biological treatment is carried out only in some places and the information required for estimating emissions is not centralized and hence unavailable.

49. Under category 4.C.1 (waste incineration), Colombia reported CO_2 emissions from incineration of specialized waste (used oils, hazardous residues, medical waste) for 2009–2018. Colombia reported "NA" for 1990–2008 because the incineration of such waste was not recorded until 2009, as clarified in the BUR. However, it was not clear to the TTE whether emissions did not occur from 1990 to 2008 or were not estimated. During the technical analysis, the Party acknowledged that the use of "NA" is incorrect and indicated that it will report the correct notation key ("NE") in its next BUR.

50. The NIR provides an update to all GHG inventories reported in the Party's second BUR. The information reported provides an update of the Party's second BUR, which

[4] http://www.ideam.gov.co/web/ecosistemas/inventario-forestal-nacional (in Spanish).

[5] See http://www.ideam.gov.co/documents/11769/44688974/Protocolo+de+PDI+para+la+cuantificacion+de+la+deforestacion+en+colombia+v2_1_.pdf/00b95004-53dd-49f9-ab09-16d8803ccd92?version=1.0 (in Spanish).

addresses anthropogenic emissions and removals for 1990–2014. The update was carried out for 1990–2018 using the methodologies contained in the 2006 IPCC Guidelines, thus generating a consistent 28-year time series (notwithstanding the issues raised in para. 40 above). The Party reported in its NIR (chap. 7) that it recalculated emissions for the energy, IPPU, AFOLU and waste sectors for 1990–2014 owing to changes in GWP factors and improvements in methodological tier levels. Colombia reported that recalculations were also performed because of updated data sources and approaches, resulting in an average annual decrease in estimated emissions for the 1990–2014 time series of 3.5 per cent.

51. Colombia described in its BUR (chap. 1.1) the institutional framework for the preparation of its 2022 GHG inventory. The Party reported that the national climate change national system, established in 2016 and coordinated by a Climate Change Inter-sectoral Commission, is responsible for the national climate change policy, while IDEAM is responsible for generating the information for the GHG inventory. These roles were formally institutionalized through the Climate Change Law (21 July 2018) and resolution 1447 (1 August 2018), which also established the national GHG inventory data management platform. The cycle of the GHG inventory updates is clearly defined and explained in the NIR (chap. 1.2.2). The most recent update was prepared with the support of the United Nations Development Programme.

52. Colombia clearly reported in its NIR that a key category analysis was performed for both the level of emissions and the trend in emissions. The Party provided qualitative information on the results in BUR table 2.23. Of the 38 key categories identified, 19 were identified as key categories in the four assessments carried out (level and trend assessments using tier 1 and 2 approaches). For the first time, Colombia reported quantitative information on the key category analysis (NIR annex I). The TTE commends Colombia for enhancing the transparency of its reporting.

53. The BUR provides information on quality assurance/quality control measures for all sectors. The information reported includes the different procedures and roles of each organization involved in the quality assurance/quality control process, including for the AFOLU sector. The TTE commends Colombia for providing information in accordance with the 2006 IPCC Guidelines.

54. Colombia clearly reported information on CO_2 emissions from fuel combustion using both the sectoral and the reference approach for 2018. The information reported indicates that the combustion emissions estimated under the sectoral and reference approach are 80,417 and 82,043 Gg CO_2 respectively. The difference between the estimates calculated using the two approaches was reported as 1.98 per cent. The Party made improvements to the information reported, for example by adjusting the national energy balance to address the imbalance due to excess of offer in some fuels.

55. Information was clearly reported on international aviation and marine bunker fuels.

56. Colombia reported information on the uncertainty assessment (level and trend) of its national GHG inventory. The uncertainty analysis was based on a combination of tier 1 and 2 approaches, depending on the category, 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 –4.51 to +4.87 per cent and the trend uncertainty is 8.3 per cent.

57. The TTE noted that the transparency of the information reported on GHG inventories could be further enhanced by addressing the areas noted in paragraphs 39, 40, 42, 43, 45, 47 and 49 above, which could facilitate a better understanding of the information reported on GHG inventories.

58. In paragraphs 32, 36, 37, 39, 40, 43 and 44 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 GHG inventories could be further enhanced. The current TTE noted the improvements referred to in paragraphs 32, 36, 37 and 41 above and commends the Party for enhancing the transparency of its reporting.

59. Colombia reported in its BUR that it developed a GHG inventory system with the objective of producing information that is compliant with the requirements of the ETF (section 4.3 and subsection 4.3.3). This initiative is related to the establishment of

institutional arrangements for the preparation of the GHG inventory, the standardization of methodologies and procedures for calculating GHG estimates and the development of a platform to improve data accessibility across sectors. The TTE commends the Party for the clear and comprehensive reporting on its proactive approach to preparing for ETF implementation.

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

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

61. The information reported provides a clear and comprehensive overview of the Party's mitigation actions and their effects. In its BUR, Colombia reported information on its mitigation actions, including on the integration of climate actions into its development plans; an analysis of the evolution of public policies on climate change mitigation in Colombia in 2018–2021; information on institutional arrangements with respect to mitigation; a description of the NDC updated in 2020; and a description of its mitigation actions, including a detailed timeline for 2000–2018. Colombia's NDC establishes as a main goal emitting a maximum of 169.44 Mt CO_2 eq in 2030, equivalent to 51 per cent of projected emissions for 2030 in the reference scenario, with emissions decreasing between 2027 and 2030 and moving towards the achievement of carbon neutrality by 2050.

62. 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.

63. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Colombia clearly reported the names of mitigation actions or groups of actions, coverage (sector and gases) and progress indicators in the BUR (tables 3.3–3.14) and expanded on the information in annex 3.1 (tables 3.19–3.30). A clear description of mitigation actions, as well as information on quantitative goals, was provided in the BUR.

64. The Party clearly reported information on methodologies and assumptions, the objectives of the actions and steps taken or envisaged to achieve those actions, and results achieved for key mitigation actions in the energy, housing and urban planning, agriculture, industry, environment and transport sectors. The Party also reported the results of implementing its mitigation actions, including estimated emission reductions for some of the actions and mitigation co-benefits.

65. The Party provided a comprehensive description of strategies, sectoral plans, NAMAs, REDD+ activities and projects under the clean development mechanism. For the implementation of its mitigation actions, Colombia has a portfolio of 32 measures of a national character, 89 subnational measures led by territorial entities, 24 measures led by companies and 3 specific measures for black carbon reduction, making a total of 148 measures. The Party reported on three national economic instruments applied to mitigation: a national carbon tax (defined in Law 1819 of 2016 on tax reform), a mechanism for enforcing the offsetting carbon tax obligations under the Carbon Tax Law (created under decree 926 of 2017) and a programme of tradable quotas of GHG emissions (created under Law 1931 of 2018).

66. Colombia reported mitigation actions in the energy sector. Actions are grouped in five strategic areas, namely energy efficiency, fugitive emissions, energy demand management, energy generation and energy substitution. Actions for the first four areas are under implementation, while energy substitution is formulated but still does not have a starting year for implementation. Emission reduction potentials have been projected for all areas, the most significant being for energy generation, with estimates in the order of 8.31 Mt CO_2 eq by 2030 to be achieved as a result of actions linked to (1) the diversification of the energy mix and the transformation of non-interconnected areas through the use of local energy resources, (2) the promotion of cost-effective solutions for more productive and sustainable electricity generation over time and (3) an increase in service provision coverage through the use of reliable technologies with a lower EF or the interconnection of decentralized energy sources

with the national grid. Also noteworthy is the fugitive emissions area, which has potential reductions of between 1.59 and 2.74 Mt CO_2 eq by 2030 for measures that entail applying better practices and technological improvements. The overall objective of the mitigation actions in the energy sector is a reduction in emissions of 11.20 Mt CO_2 eq by 2030.

67. Mitigation actions for housing and urban planning are focused on four strategic areas: sustainable construction, sustainable urban and territorial development, comprehensive solid waste management and domestic wastewater management. Two NAMAs, on municipal solid waste and on habitat, are also included in this sector. With regard to emission reductions, the NAMA on municipal solid waste involves the application of technologies for the collection, burning and use of biogas from final disposal sites and the optimization of the three biogas systems that already exist in the country. Composting technologies will also be applied. Waste-to-energy technology constitutes the fundamental basis of the mitigation scenario with a treatment capacity of 100 per cent of the municipal solid waste that reaches the final disposal sites and a mitigation potential of 8.51 Mt CO_2 eq by 2030.

68. Mitigation actions in the agriculture sector include a strategic area of consolidating the production chain of commercial forest plantations as a contributor to carbon dioxide capture by incentivizing the establishment of plantations through the issuing of forest certificates, with estimated reductions by 2030 of 10.36 Mt CO_2 eq and with an estimated 300,000 ha plantations to be established by 2030. However, the objective is to increase the annual growth in land covered by plantations to 34,165 ha per year, which would be equivalent to 368,836 ha commercial forest plantations by 2030. A further two strategic approaches were reported: the first focuses on reducing GHG emissions from cocoa production by increasing areas dedicated to cocoa cultivation under agroforestry systems and by renovating and rehabilitating less productive crops with a view to increasing carbon stock and absorption; and the second focuses on reducing emissions from rice production (mainly N_2O emissions owing to a reduction in fertilizer consumption). The main actions in this sector are complemented by three NAMAs – on sustainable cattle ranching, sustainable coffee production and sustainable panela (unrefined cane sugar) production.

69. Regarding the industry sector, three main approaches to mitigation action were identified by Colombia. The first relates to energy management and energy efficiency and comprises two measures: (1) identifying, structuring and implementing projects and programmes on good operating practices, process improvements and the use of energy sources with a low EF, aimed at achieving emission reductions of 1.67 Mt CO_2 eq by 2030 versus the 'business as usual' scenario; and (2) promoting the integral development of productive brick-manufacturing units by building capacity in energy management, improving processes and transferring good operating practices, with projected emission reductions of 0.19 Mt CO_2 eq by 2030. The second approach, on sustainable production processes, also has two main measures: (1) reducing by 0.6 Mt CO_2 eq by 2030 N_2O emissions from production of nitric acid; and (2) reducing emissions by 0.71 Mt CO_2 eq by 2030, mainly through the management of waste by increasing cogeneration by up to 15 per cent in cement plants. The third approach, on sustainable logistics operations, is still at the planning stage.

70. In the transport sector, the main national mitigation actions are grouped under four strategic approaches: (1) performance-based navigation; (2) the modernization of automotive freight transportation; (3) the rehabilitation of the La Dorada-Chiriguaná-Santa Marta railway corridor; and (4) the transfer of freight routes from highways to the Magdalena River. There are three NAMAs in the transport sector: "MOVE and electric mobility", "Active Transport and Demand Management" and "Transport Oriented Development". Strategic approaches 1, 2 and 4 began in 2015 and approach 3 in 2020. The three NAMAs are under implementation. In view of its projected impact in terms of reducing emissions, approach 2 is the most significant of the four approaches. The aim of the measure is to modernize the cargo fleet of vehicles that are over 10.5 t gross weight and more than 20 years old, with estimated reductions of 1.03 Mt CO_2 eq per year by 2030 compared with the 'business as usual' scenario. Regarding NAMAs, "MOVE and electric mobility" is notable for its projected emission reduction of 4.04 Mt CO_2 eq per year by 2030 compared with the 'business as usual' scenario, to be achieved through the introduction and registration of 600,000 electric vehicles.

71. Mitigation actions in the environment sector are associated with two main strategic approaches: biodiversity and ecosystem services; and good practices and efficient use of resources. The first approach seeks to ecologically restore a cumulative total of 962,615 ha land between 2015 and 2030, with an expected reduction in emissions of 16.94 Mt CO_2 eq. The second covers two main measures: the replacement of traditional wood stoves with efficient cookstoves (1 million between 2021 and 2030), with a projected reduction in emissions of 2.29 Mt CO_2 eq; and the use of substitute products for substances that deplete the ozone layer, with a projected reduction in emissions of 0.84 Mt CO_2. Actions under both strategic approaches are under implementation. The Party reported a cross-sectoral mitigation measure for reducing deforestation, which is not part of the strategic approaches. The projected emission reduction resulting from this measure, for the implementation period 2015–2023, amounts to 59.18 Mt CO_2 eq.

72. Updated information on projected emission reductions for some actions in the energy, transport and environment sectors was not provided in the BUR. During the technical analysis, the Party clarified that an MRV system for the mining and energy sectors has been established. An initial report containing a comparison between the baseline scenario and the scenario in which mitigation actions are implemented will be published in the near future. With regard to the transport sector, the Party clarified that MRV systems are being developed and the indicators for tracking emission reductions have not yet been formulated. Regarding the cross-sectoral measure to reduce deforestation referred to in paragraph 71 above, the Party explained that the reduced emissions are calculated in line with its REDD+ technical annex, which was still under internal assessment when the Party's third BUR was submitted. The Government of Colombia is still preparing the estimates for 2018 and will include the GHG emission reductions in future reports.

73. Colombia provided information on its involvement in international market mechanisms as a Party to the Kyoto Protocol. Colombia documented 61 clean development mechanism projects active from 2018 to date (BUR table 3.15). The projects concern energy (24), waste (18), forestry (8), industry (6) and transport (5). The statistics include information on the total projects, sectors covered and quantity of certified emission reductions issued.

74. Colombia reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that Colombia has made significant progress in the design and implementation of various systems for the collection, calculation, reporting and verification of quality of information on climate change and of other processes necessary for its management. Mitigation MRV is part of the Party's national climate change information system, which in turn is integrated into its environmental information system. The MRV of mitigation actions at the national level is regulated by resolution 1447 of 2018 and includes the IDEAM forest and carbon monitoring system, the GHG inventory system, the national registry of GHG emission reductions, and the GHG reduction and removal system. The Party outlined the steps on a proposed pathway to establishing an enhanced MRV system, including establishing institutional arrangements, defining mitigation accounting standards, monitoring data-collection responsibilities, defining reporting obligations and defining verification approaches and roles.

75. The TTE noted that the transparency of the information reported on mitigation actions could be further enhanced by addressing the area noted in paragraph 72 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

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

77. Colombia clearly reported information on financial, technical and capacity-building needs in accordance with decision 2/CP.17, annex III, paragraph 14, which are primarily in the areas of preparation of national reports and the GHG inventory, mitigation, adaptation and gender. Colombia identified the need for financial sustainability over time for the development of reports, including establishing a permanent technical team of technical staff

to ensure that, in preparing for transition to reporting under the ETF, information is updated and correctly used. Colombia identified the need to achieve financial sustainability through national and international resources that support permanent technical teams, especially in IDEAM, and to develop and implement a computer platform that supports the current and future commitments of the country in terms of the inventory. In the area of mitigation, Colombia reported needs for 21 measures included in its NDC for activities related to cattle ranching, coffee production, panela production, cooling systems, solid waste and domestic wastewater management, energy efficiency, fertilizer production, cement production and supply centres for manufacturing industries. Furthermore, Colombia reported needs for the implementation of transport and climate change plans of the Ministry of Environment and Sustainable Development and the Ministry of Housing. Regarding adaptation, Colombia referred to the 132 financial, technology development and transfer, and capacity-building needs reported in the adaptation communication submitted as a component of its NDC for the energy, transport, environment and natural resources, agriculture, industry, waste, health and housing sectors.

78. Information on constraints and gaps was not reported in Colombia's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that the methodology applied for the identification of financial, capacity-building and technology transfer needs does not include constraints and gaps. Colombia will work to improve the methodology to include analysis of constraints and gaps in future reports.

79. Colombia 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, Colombia reported that in 2018–2020 it received USD 459,712,282 from bilateral and multilateral sources for the implementation of 206 initiatives, with 60 per cent of the total amount from bilateral sources for 112 initiatives and 40 per cent from multilateral sources for 94 initiatives (22.4 per cent from multilateral development banks, 15.3 per cent from funds under the UNFCCC and 2.3 per cent from other sources). The support was allocated as follows: 51 per cent to cross-cutting initiatives (mitigation and adaptation), 26 per cent to adaptation and 23 per cent to mitigation. Information was reported on sectors, source of support, thematic area (adaptation, mitigation and cross-cutting), implementing agency and total amount of support received.

80. Information on funding for the preparation of the BUR was not clearly reported in Colombia's BUR. During the technical analysis, the Party clarified that preparation of its third BUR was financed by the Global Environment Facility, which provided USD 352,000. The implementing agency was the United Nations Development Programme.

81. Information on nationally determined technology needs and support received was not reported transparently in Colombia's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that the required funds and technical capacities have not been allocated to the development of a national technology needs assessment; however, the mitigation measures reported in its BUR (table 5.3, p.330) include technology needs. Furthermore, Colombia indicated that it aims to ramp up efforts to address these needs. In particular, it aims to foster public–private partnerships, promote innovation, catalyse the use of technology road maps, and facilitate the linkage between research and development activities. Funds and technical capacity have therefore not been allocated to developing an integral technology needs assessment.

82. The TTE noted that the transparency of the information reported on needs and support received could be enhanced by addressing the areas noted in paragraphs 78, 80 and 81 above, which could facilitate a better understanding of the information reported on needs and support received.

5. Any other information

83. Colombia reported on 30 adaptation goals included in its NDC that were updated in 2020 (BUR chap. 5, annex 5.1, p.343), with details of sector, goal and implementing institution.

D. Identification of capacity-building needs

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

(a) Applying data gap filling techniques included in the 2006 IPCC Guidelines;

(b) Estimating GHG emission reductions resulting from mitigation actions, as well as refining the estimates of these reductions before implementing the actions;

(c) Strengthening national capacity to develop pilot projects for technologies such as hydrogen energy, geothermal energy, biomass energy production and storage, and carbon dioxide capture, use and storage, as well as to generate inputs for the future formulation of regulation for these technologies;

(d) Updating the methodology used for identifying financial, capacity-building and technology transfer needs to include the identification of gaps and barriers;

(e) Identifying, classifying and reporting technology needs, which must be nationally determined, and technology support received.

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

(a) Preparation of national reports (NCs and BURs), including preparation for the transition to the ETF;

(b) GHG inventory preparation;

(c) Adaptation to climate change;

(d) Mitigation;

(e) Gender.

86. In paragraph 68 of the summary report on the technical analysis of Colombia's second BUR, the previous TTE, in consultation with Colombia, identified and prioritized capacity-building needs. During the technical analysis, the Party clarified the status of the following capacity-building needs:

(a) Improving the quality assurance/quality control process by reviewing the notation keys used in the GHG inventory; by ensuring the correct transcription and consistent use of notation keys in the summary tables; and by providing transparent information on the use of notation keys in the BUR – addressed;

(b) Accessing financial resources to implement the improvement plans related to the systematic collection and compilation of country-specific AD and EFs, which will enable the tier 2 methodology to be used for key categories (e.g. oil and natural gas (1.B.2) and industrial wastewater treatment and discharge (4.D.2)) – partly addressed;

(c) Refining the estimation of emissions using the reference approach and strengthening the AD collection process for national statistics at the appropriate level of disaggregation for the reference approach in order to better explain the differences in the results obtained between the reference and the sectoral approach – partly addressed;

(d) Supporting the improvement plan for the estimation of PFC emissions by facilitating the exchange of experience with other countries regarding the tools for collecting information on the consumption and use of PFCs (e.g. information on consumers, products and quantity consumed) and the entities responsible for collecting and disseminating information – partly addressed;

(e) Improving the EFs for forest land and for the conversion of forest land to non-forest land-use categories through the national forest inventory – partly addressed;

(f) Improving the uncertainty estimates by implementing a capacity-building programme for the entities providing AD in order to enable them to provide the uncertainty ranges associated with AD so as to avoid the need for expert consultation; by implementing a programme to estimate EFs together with their uncertainty ranges; and by optimizing the

uncertainty estimation processes for the two methods currently used by Colombia through designing and implementing an information technology platform for managing and calculating the national GHG inventory – partly addressed;

(g) Strengthening the capacity to collect information on technology and capacity-building needs at the subnational level in a standardized manner – partly addressed;

(h) Strengthening the capacity of national entities and the MRV system to identify and report the technology needs for implementing the territorial and sectoral climate change management plans, including identifying the criteria for categorizing and differentiating financial, technical and technology needs in a standardized manner – not addressed.

III. Conclusions

87. The TTE conducted a technical analysis of the information reported in the third BUR of Colombia 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; financial, technical and capacity-building needs, including a description of support needed and received and domestic MRV. During the technical analysis, additional information was provided by Colombia on the estimation of emissions in the AFOLU sector. The TTE concluded that the information analysed is mostly transparent.

88. Colombia reported an update on the institutional arrangements relevant to the preparation of its BURs. It has taken significant steps to establish institutional arrangements that enable sustainable preparation of its BURs, such as making organizational improvements and establishing knowledge-sharing procedures to facilitate sectoral information transfer. Colombia approved its Climate Change Law in July 2018, which establishes the guidelines and instruments for managing climate change, promoting the transition to a competitive, sustainable economy and low-carbon development, as well as establishing the National Climate Change System. IDEAM, an agency of the Ministry of Environment and Sustainable Development, is the entity responsible for the preparation of NCs and BURs.

89. In its third BUR, submitted in 2022, Colombia reported information on its national GHG inventory for 1990–2018. This included GHG emissions and removals of CO_2, CH_4, N_2O, HFCs, PFCs and SF_6 for all relevant sources and sinks as well as the precursor gases. The inventory was developed on the basis of the 2006 IPCC Guidelines. The total GHG emissions for 2018 were reported as 180,727.23 Gg CO_2 eq (excluding land and HWP) and 279,198.61 CO_2 eq (including land and HWP). Of the 38 key categories identified using level and trend assessment, 19 were identified as key categories considering level and trend assessments using tier 1 and 2 approaches, with CO_2 and the AFOLU and energy sectors identified as the main gas and sectors respectively.

90. Colombia reported information on mitigation actions and their effects in both tabular and narrative format, including the evolution of public policies on climate change mitigation, the institutional arrangements relating to climate change mitigation, the identification of emission reduction targets, and the baseline and mitigation scenarios for 2030. The Party reported on the status of the mitigation actions, grouped in six sectors: energy, housing and urban planning, agriculture, industry, transport and environment. The Party reported the progress of implementation of its mitigation actions and the results achieved, including in some cases identifying emission reductions. Colombia's NDC establishes as the main target emitting a maximum of 169.44 Mt CO_2 eq in 2030, equivalent to 51 per cent of projected emissions for 2030 in the reference scenario, with emissions decreasing between 2027 and 2030 and moving towards the achievement of carbon neutrality by 2050. The Party also reported information on its involvement in international market mechanisms and on its MRV arrangements.

91. Colombia reported that its financial, technical and capacity-building needs are primarily in the areas of preparation of national reports and the GHG inventory, mitigation, adaptation and gender. Colombia reported information on financial resources, technology transfer, capacity-building and technical support. In its BUR, Colombia reported that in 2018–2020 it received USD 459,712,282 from bilateral and multilateral sources for the implementation of 206 initiatives. The support was allocated as follows: 51 per cent to cross-cutting initiatives (mitigation and adaptation), 26 per cent to adaptation and 23 per cent to mitigation. Information was reported on sectors, source of support, thematic area (adaptation, mitigation and cross-cutting), implementing agency and total amount of support received.

92. 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 improvements.

93. The TTE, in consultation with Colombia, identified five capacity-building needs listed in chapter II.D above 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.

Annex I

Extent of the information reported by Colombia 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 Colombia

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, paragraph 41(g)	The first BUR shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available, and subsequent BURs shall cover a calendar year that does not precede the submission date by more than four years.	Yes	Colombia submitted its third BUR in January 2022; the GHG inventory reported is 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	Colombia used a combination of the 2019 Refinement to the 2006 IPCC Guidelines and 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	Colombia submitted an NIR as a technical annex to its third BUR, containing updated AD and EFs for all sectors.
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	
	(b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines.	Yes	Colombia applied the 2006 IPCC Guidelines and comparable tables were provided in both the BUR (table 5.10) and the NIR.
Decision 2/CP.17, annex III, paragraph 7	Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in its previous NCs.	Partly	Colombia provided an update of the previously reported inventories and reported a complete time series (1990–2018), including recalculations. Some categories in the energy sector were reported as “NE” for some years of the time series: categories 1.A.1.c.ii.3 for 1990–2009, 1.A.2.i and 1.A.2.k for 1990–2009 and 1.A.1.ai.2 for 1990–2007. In the waste sector, emissions for category 4.C.2 were estimated for 2009–2018

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
			and reported as "NA" for 1990–2008.
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 1990–2018.
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:	Yes	The inventory chapter of the BUR (chap. 2) contains summary information from the NIR.
Decision 2/CP.17, annex III, paragraph 9	(a) Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors);	Yes	Comparable information was reported on GHG emissions and removals and precursors in the BUR (table 2.10 for GHGs for 2018 and table 2.26 for precursors for 2010–2018) and in the NIR (annex 4, tables 4-1–4-3, and annex 17, table 17-2).
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6).	Yes	Comparable information was reported on GHG emissions and removals and precursors in the BUR (table 2.10 for GHGs for 2018 and table 2.26 for precursors 2010–2018) and in the NIR (annex 4, tables 4-1–4-3).
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 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 (table 2.23) and NIR (table 1-9) Colombia provided a summary of the key category analysis (level and trend), which was conducted 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 procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories was reported in the NIR and 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:		
Decision 17/CP.8, annex, paragraph 14	(a) CO_2;	Yes	
	(b) CH_4;	Yes	
	(c) N_2O.	Yes	
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	

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	(a) HFCs;	Yes	
	(b) PFCs;	Yes	
	(c) SF_6.	Yes	
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;	Yes	Provided for 2010–2018.
	(b) Nitrogen oxides;	Yes	Provided for 2010–2018.
	(c) Non-methane volatile organic compounds.	Yes	Provided for 2010–2018.
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	The Party reported for 2010–2018 on other gases, such as sulfur oxides, particulate matter and black carbon.
Decision 17/CP.8, annex, paragraph 18	Non-Annex I Parties are encouraged, to the extent possible, and if disaggregated data are available, to estimate and report CO_2 fuel combustion emissions using both the sectoral and the reference approach and to explain any large differences between the two approaches.	Yes	
Decision 17/CP.8, annex, paragraph 19	Non-Annex I Parties should, to the extent possible, and if disaggregated data are available, report emissions from international aviation and marine bunker fuels separately in their inventories:		
	(a) International aviation;	Yes	
	(b) Marine bunker fuels.	Yes	
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	The Party used the GWP provided in the AR5.
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	Colombia used the 2006 IPCC Guidelines. BUR table 2.6 contains a summary of the methodologies used for estimating emissions and removals. The NIR specifies in detail which EFs were used for

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
			each category reported in the GHG inventory.
	(b) Explanation of the sources of EFs;	Yes	Colombia used the 2006 IPCC Guidelines. The BUR specifies in detail which EFs were used for each category reported in the GHG inventory and which ones were extracted from the 2006 IPCC Guidelines.
	(c) Explanation of the sources of AD;	Yes	Colombia used the 2006 IPCC Guidelines. The NIR specifies in detail the sources of AD that were used for each category reported in the GHG inventory.
	(d) If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe:	Yes	Colombia used the 2006 IPCC Guidelines. Tier 1, 2 and 3 methodologies were used.
	(i) Source and/or sink categories;		Colombia reported on country-specific sources of black carbon emissions as a precursor gas in the BUR (chap. 2, section 9).
	(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.	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:		
	(a) Level of uncertainty associated with inventory data;	Yes	
	(b) Underlying assumptions;	Yes	
	(c) Methodologies used, if any, for estimating these uncertainties.	Yes	

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 Colombia

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;	Yes	
	(ii) Assumptions;	Yes	
	(c) Information on:		
	(i) Objectives of the action;	Yes	
	(ii) Steps taken or envisaged to achieve that action;	Yes	
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Yes	
	(ii) Progress of implementation of the underlying steps taken or envisaged;	Yes	
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Yes	
	(e) Information on international market mechanisms.	Yes	
Decision 2/CP.17, annex III, paragraph 13	Parties should provide information on domestic MRV arrangements.	Yes	

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

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

Decision	*Provision of the reporting requirements*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision /CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on:		
	(a) Constraints and gaps;	No	
	(b) Related financial, technical and capacity-building needs.	Yes	
Decision /CP.17, annex III, paragraph 15	Non-Annex I Parties should provide:		
	(a) Information on financial resources received, technology transfer and capacity-building received;	Yes	
	(b) Information on technical support received from the Global Environment Facility, Parties included in Annex II to the Convention and other developed country Parties, the Green Climate Fund and multilateral institutions for activities relating to climate change, including for the preparation of the current BUR.	Partly	Information on funding for the preparation of the BUR was not reported.
Decision /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	There is no mention of the nationally determined character of the needs reported in the BUR.
	(b) Technology support received.	No	

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/gpglulucf/gpglulucf.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.

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 and second BURs of Colombia. Available at https://unfccc.int/BURs.

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

Summary reports on the technical analysis of the first and second BURs of Colombia, contained in documents FCCC/SBI/ICA/2016/TASR.1/COL and FCCC/SBI/ICA/2019/TASR.2/COL 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:

Model used to derive emission factors for the agriculture and livestock sectors. MODELO AFOLU 1 – Colombia https://biocarbono.org/calculo-de-factores-de-emision-de-metano-ch4-enterico-y-de-gestion-de-estiercol-para-ganado-bovino-en-colombia-por-metodologia-tier-2/.

National Forest and Carbon monitoring portal, where activity data for land use change from forest is derived from: Sistema de Monitoreo de Bosque e Carbono (SMByC) http://smbyc.ideam.gov.co/MonitoreoBC-WEB/reg/indexLogOn.jsp.

National Forest Inventory portal, where emission factors for land use change from forest is derived from: Sistema Nacional de Inventario Forestal (SNIF) INVENTARIO FORESTAL NACIONAL - IDEAM.

Governing Framework of the National Forest Inventory https://drive.google.com/file/d/10ZMj7TCMrGd9e6MBDLgf6HMC4g4qzWyY/view?usp=sharing.

Updated agriculture and livestock statistics portal: Red de Información y Comunicación del Sector Agropecuario de Colombia (AGRONET) https://www.agronet.gov.co/estadistica/Paginas/home.aspx?cod=59.