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Technical analysis of the first biennial update report of Antigua and Barbuda submitted on 3 March 2020

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 Antigua and Barbuda, 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

AD	activity data
AFOLU	agriculture, forestry and other land use
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BUR	biennial update report
CBIT	Capacity-building Initiative for Transparency
CGE	Consultative Group of Experts
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
DOE	Department of Environment of Antigua and Barbuda
EF	emission factor
EPMA 2019	national Environmental Protection and Management Act, 2019
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
HWP	harvested wood products
ICA	international consultation and analysis
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	<i>Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories</i>
IPCC good practice guidance for LULUCF	<i>Good Practice Guidance for Land Use, Land-Use Change and Forestry</i>
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
N	nitrogen
NA	not applicable
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
N ₂ O	nitrous oxide
PFC	perfluorocarbon
Revised 1996 IPCC Guidelines	<i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</i>
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”
2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>

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 BURs 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 Antigua and Barbuda, 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, Antigua and Barbuda submitted its first BUR on 3 March 2020 as a stand-alone update report.
6. A desk analysis of Antigua and Barbuda's BUR was conducted from 22 to 26 June 2020¹ 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: Siriluk Chiarakorn (Thailand), Ana-Maria Danila (former member of the CGE from the European Union), Ryan Deosaran (Trinidad and Tobago), Madeleine Rose Diouf (former member of the CGE from Senegal), Leticia Guimarães (Brazil), Juan Luis Martin Ortega (El Salvador), Esther Mertens (Belgium), Noura Mohamed Lotfy (Egypt), Sekai Ngarize (Zimbabwe), Emma Salisbury (United Kingdom of Great Britain and Northern Ireland), Ioannis Sempas (Greece), Virginia Sena Cianci (member of the CGE from Uruguay), Chisa Umemiya (Japan), Maarten van der Eynden (Norway) and Alexander Zahar (Australia). Ms. Danila and Ms. Ngarize were the co-leads. The technical analysis was coordinated by Anna Sikharulidze, Hiroaki Odawara and Sabin Guendehou (secretariat).
7. During the technical analysis, in addition to the written exchange, through the secretariat, to provide technical clarifications on the information reported in the BUR, the TTE and Antigua and Barbuda engaged in consultation² on the identification of capacity-building needs for the preparation of BURs and participation in the ICA process. Following the technical analysis of Antigua and Barbuda's first BUR, the TTE prepared and shared a draft summary report with Antigua and Barbuda on 18 September 2020 for its review and comment. Antigua and Barbuda, in turn, provided its feedback on the draft summary report on 14 December 2020.
8. The TTE responded to and incorporated Antigua and Barbuda's comments referred to in paragraph 7 above and finalized the summary report in consultation with the Party on 25 January 2021.

¹ Owing to the circumstances related to the coronavirus disease 2019, the technical analysis of the BUR submitted by Antigua and Barbuda had to be conducted remotely.

² The consultation was conducted via videoconferencing.

II. Technical analysis of the biennial update report

A. Scope of the technical analysis

9. 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).

10. The remainder of this chapter presents the results of each of the three parts of the technical analysis of Antigua and Barbuda's BUR outlined in paragraph 9 above.

B. Extent of the information reported

11. The elements of information referred to in paragraph 9(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.

12. 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 11 above have been included in the BUR of the Party concerned. The TTE considers that the reported information is partially 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 annex I.

C. Technical analysis of the information reported

13. The technical analysis referred to in paragraph 9(b) above aims to increase the transparency of information reported by 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.

14. 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. Antigua and Barbuda 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 in the NIR using the agreed GHG inventory tool.

15. 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

16. 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.

17. Antigua and Barbuda reported in its first BUR information on its national circumstances, including its location and land area, topographic profile, climate, socioeconomic profile (relating to population, employment, poverty and human development), environment and risks to natural resources (such as marine and coastal ecosystems), economy, ongoing mitigation activities and associated challenges in different sectors (energy, transportation, forestry and land-use, and waste sectors) and a description of national development priorities and a national climate finance strategy aimed at transformational change to enable sustainable development in the country.

18. In addition, Antigua and Barbuda provided a summary of relevant information regarding its national circumstances in tabular format.

19. Antigua and Barbuda transparently reported in its first BUR information on its existing and planned 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 recent designation of DOE under the Ministry of Health, Wellness and the Environment for the regular preparation of national reports on climate change to be submitted to the secretariat. The responsibilities of DOE in this regard are enacted under EPMA 2019. The Party described in its BUR the planned institutional arrangements for the preparation of NCs and BURs on a continuous basis, including the roles and responsibilities of DOE as the overall coordinating entity, the involvement and roles of other bodies and experts and the process for information and data exchange.

20. Information on the current status of Antigua and Barbuda's institutional arrangements, particularly with regard to the development of its planned institutional arrangements, was not clearly reported in its BUR. During the technical analysis, the Party clarified that most of its planned institutional arrangements are already functioning. However, since the NCs are currently prepared on a project basis, a number of technical staff members who form an integral part of the Party's institutional arrangements are employed only on a project basis. The Party expects that the preparation of its NC4 will further advance the operationalization of its institutional arrangements.

21. The TTE noted that the transparency of the information reported on institutional arrangements could be further enhanced by addressing the areas noted in paragraph 20 above, which could facilitate a better understanding of the information reported on institutional arrangements.

22. Antigua and Barbuda reported in its first BUR information on its domestic MRV arrangements. The Party stated that, in line with EPMA 2019, it has designed the MRV system with the Environment Registry, which also serves as the MRV registry for climate change, at its core. The system is designed to cover the MRV of GHG emissions, mitigation actions and support needed and received. The development of this system will be supported through international cooperation, including a CBIT project. During the technical analysis, Antigua and Barbuda clarified that the CBIT project will run from January 2020 to December 2022.

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

23. As indicated in table I.1, Antigua and Barbuda reported information on its GHG inventory in its BUR partially 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.

24. Antigua and Barbuda submitted its first BUR in 2020 and the GHG inventory reported is for 2015. 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, Antigua and Barbuda clarified that compilation of the GHG inventory was completed by October 2019, rather than April 2018 as originally expected. The inventory could not be submitted until March 2020 because the Party was waiting to complete certain sections of the BUR before submitting the entire document.

25. Antigua and Barbuda submitted a set of documents containing information similar to that contained in an NIR (hereinafter referred to as NIR) in conjunction with its first BUR. The relevant sections of the NIR were referenced in the BUR and the documents were made publicly available on the UNFCCC website.³

26. GHG emissions and removals for the BUR covering the 2015 inventory were estimated using the 2006 IPCC Guidelines for all reported categories. Tier 1 approaches were used for all categories with the exception of industrial wastewater (alcohol refining industry), where a tier 2 approach was used to estimate CH₄ emissions. The Revised 1996 IPCC Guidelines were used to estimate NMVOC emissions, since the Party experienced challenges in estimating these emissions using the IPCC software associated with the 2006 IPCC Guidelines. The TTE commends the Party for using the most recent guidelines.

27. Information on AD and EFs used and their sources was clearly reported in the BUR, including information on the EFs and AD used to estimate emissions for the categories reported. This information was provided in the NIR provided by the Party for each sector, which included the files from the IPCC software and Excel files, where the EFs and AD are listed.

28. Information on the Party's total GHG emissions by gas for 2015 as calculated by the TTE using information from the BUR and GWP values from the AR2 is outlined in table 1 in Gg CO₂ eq.

Table 1

Greenhouse gas emissions by gas of Antigua and Barbuda for 2015

<i>Gas</i>	<i>GHG emissions (Gg CO₂ eq) including land and HWP^a</i>	<i>GHG emissions (Gg CO₂ eq) excluding land and HWP^a</i>
CO ₂	844.28	652.74
CH ₄	31.87	31.87
N ₂ O	15.08	15.08
HFCs	6.05	6.05
PFCs	NO	NO
SF ₆	NO	NO
Other	NA	NA
Total	897.27	705.73

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

29. Information on other emissions was clearly reported, including 0.04 Gg NMVOCs.

30. Information on SF₆ and PFC emissions was not reported in Antigua and Barbuda's BUR and the reason for this was not clear to the TTE. The Party did not use notation keys to explain the omission. Information on HFC emissions was not reported on a gas-by-gas basis for each HFC used in refrigeration and air conditioning and in aerosols. During the technical analysis, the Party clarified that it did not report SF₆ and PFC emissions because there were no such emissions under the categories that were estimated. As for HFC emissions, the Party clarified that it faces capacity constraints in relation to trained inventory experts for the IPPU sector and that it will attempt to report these emissions on a gas-by-gas basis in future submissions.

³ <https://unfccc.int/documents/210244>.

31. Information on NO_x and CO emissions was not reported in Antigua and Barbuda's BUR and the reason for this was not clear to the TTE. The Party did not use notation keys to explain the omission. During the technical analysis, the Party clarified that it did not report these emissions because there were no such emissions under the categories that were estimated.

32. Emission estimates were reported as a zero value for some categories in the summary report table (BUR table 3, pp.60–63) and the reason for this was not clear to the TTE. The Party did not use notation keys or explain whether the activity does not occur in the country or the information was included elsewhere, or whether emissions were not estimated owing to a lack of AD or were considered negligible. During the technical analysis, the Party clarified that it will use notation keys in future submissions.

33. Antigua and Barbuda reported comparable information addressing the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines. Antigua and Barbuda did not report comparable information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF. For categories 3.B.2.a cropland remaining cropland and 3.B.3.a grassland remaining grassland, the IPCC worksheets were provided as additional Excel sheets, which included some information on carbon stock change in soils and biomass for cropland and grassland.

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 calculated by the TTE using information from the BUR and GWP values from the AR2, in 2015 are reflected in table 2.

Table 2

Shares of greenhouse gas emissions by sector of Antigua and Barbuda for 2015

<i>Sector</i>	<i>GHG emissions (Gg CO₂ eq)</i>	<i>% share^a</i>
Energy	650.89	92.2
IPPU	9.82	1.4
AFOLU	204.75	NA
Livestock (category 3.A)	13.21	1.9
Land (category 3.B)	191.54	NA
Aggregate sources and non-CO ₂ emissions sources on land (category 3.C)	NE	NA
HWP and other emissions (category 3.D)	NE	NA
Waste	31.80	4.5

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

35. Antigua and Barbuda did not report information on the use of GWP values to convert emissions to CO₂ equivalents.

36. For the energy sector, information was clearly reported on CO₂, CH₄ and N₂O emissions for category 1.A fuel combustion activities under category 1.A.1.b energy industries – petroleum refining using default EFs (tier 1). The Party also reported category 1.A.1 energy industries (liquid fuels) as a key category on the basis of the key category analysis included in BUR table 14. In addition, the Party reported in the BUR that no refining activities occur in the country since all refined fuels are imported.

37. The TTE noted that the Party assigned all fuel combustion to petroleum refining, but did not use notation keys for the other fuel combustion categories to explain this assignment. During the technical analysis the Party clarified that in some cases insufficient data were available to disaggregate emissions and that this will be further investigated during the preparation of its NC4.

38. Information on category 1.B fugitive emissions from fuels was not reported in Antigua and Barbuda's BUR. However, the Party provided relevant clarification in the NIR, confirming that no relevant processes are active in the country.

39. For the IPPU sector, information was clearly reported on CO₂ emissions, using a tier 1 method with default EFs for category 2.A mineral industry (other process uses of carbonates), category 2.C metal industry (zinc production) and category 2.D non-energy products from fuels and solvent use (lubricant and paraffin wax use). The Party provided the sources of the AD and the methodology in the appendices to the BUR. Information was also clearly reported for NMVOC emissions from alcoholic beverage production using the Revised 1996 IPCC Guidelines and for N₂O emissions from medical applications. None of the IPPU sector categories are key categories.

40. For category 3.A livestock under the AFOLU sector from the 2006 IPCC Guidelines, manure management (CH₄) and enteric fermentation (CH₄) were identified as the main sources of emissions in the sector.

41. Antigua and Barbuda reported that it used default values for EFs and other relevant parameters for the AFOLU sector from the 2006 IPCC Guidelines; however, in some cases the reported values differed from default values. For example, information was not reported on the source of the nitrogen excretion rate of 1.64 kg N/1,000 kg animal mass used for swine. During the technical analysis, the Party clarified that the exact numbers of market swine and breeding swine could not be determined and this created some uncertainty. The Party further indicated that a greater effort will be made to improve the accuracy of nitrogen excretion rates in future GHG inventories.

42. For category 3.B (land), Antigua and Barbuda reported annual GHG emissions and removals for 2015. Overall, the net emissions for category 3.B were 191.54 CO₂ eq in 2015. Removals were not reported separately from emissions. Antigua and Barbuda identified improvements in the information reported; for example, data collection for forest cover was improved through a combination of aerial photography and ground truthing activities, which led to a significant increase in reporting within this category, and the use of Google Earth satellite imagery.

43. Information on emissions for category 3.B (land) for Barbuda was not clearly reported in Antigua and Barbuda's BUR. During the technical analysis, the Party clarified that this was owing to insufficient time to complete the estimates for Barbuda and a lack of data collection mechanisms.

44. Information on CO₂ emissions and direct and indirect N₂O emissions from managed soils under category 3.C (aggregate sources and non-CO₂ emissions sources on land) was not reported in the BUR. The Party clarified in the NIR that although soils in Antigua and Barbuda are not limed in recent years increased importation and use of natural and artificial fertilizers with high concentrations of urea have led to a considerable increase in CO₂ emissions. However, insufficient data on managed soils were available to assess the emissions for this category.

45. For the waste sector, information was clearly reported on CO₂, CH₄ and N₂O emissions from categories 4.B biological treatment of solid waste, 4.C incineration and open burning of waste and 4.D wastewater treatment and discharge, with a tier 1 methodology used for all estimations except those relating to emissions from industrial wastewater treatment in the alcohol refining industry, where a tier 2 approach was used. The AD and their sources and EFs were clearly reported in the appendices to the BUR.

46. Information on CH₄ emissions from category 4.A solid waste disposal was not reported in the BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that the experts attempted to estimate these emissions but encountered difficulties with the software, AD collection and gaps in the time series of the required AD.

47. Information on time series including GHG inventories of individual years reported in the Party's previous NCs was not reported in the BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that when preparing the BUR, it did not consider compiling the time series. The Party also clarified that it has decided to compile inventories for 2016–2019, with the option of compiling them for 2010 onward, which will be submitted in its NC4.

48. Antigua and Barbuda described in its BUR the institutional framework for the preparation of its 2015 GHG inventory. The Party reported that DOE, which falls under the Ministry of Health, Wellness and the Environment, is the governmental body responsible for its climate change policy and GHG inventory. The Party identified improvements in the information reported such as enhancing its inventory management system with the support of a recently approved CBIT project, which will result in improvements to data collection, quality control and quality assurance, and archiving procedures. The Party also included in the BUR sector-specific recommendations to improve AD collection.

49. Antigua and Barbuda clearly reported that a key category analysis was performed for the level of emissions. The Party reported the results of the key category analysis in BUR table 14, applying the approach 1 level assessment for the GHG inventory for 2015 and using the IPCC software. The Party identified improvements in the information reported such as a key category analysis performed on a time series of data.

50. Information on a key category analysis performed for the trend in emissions was not reported in Antigua and Barbuda's BUR. However, the Party clarified in its BUR that it was not able to carry out this analysis because estimates were available only for a single year rather than several consecutive years.

51. Antigua and Barbuda clearly reported information on CO₂ fuel combustion using both the sectoral and the reference approach. The information reported indicates that the combustion emissions estimated under the sectoral and reference approach are 648.76 Gg CO₂ and 726.26 Gg CO₂, respectively. The difference between the estimates calculated using the two approaches was reported as 11 per cent.

52. Information on the reasons behind the difference between the estimates calculated using the sectoral and reference approaches was not reported in the BUR and the reason for this was not clear to the TTE. Further, the TTE noted some differences between the estimates and AD reported in the BUR, the NIR and the IPCC software files submitted with the NIR for the reference approach. During the technical analysis the Party provided additional clarification on the fuel import data and indicated that the reasons for the differences will be investigated for its next submission.

53. Information on international aviation and marine bunker fuels was not reported in the BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that the fuel consumption reported for the energy sector includes total fuel sales because sales data could not be collected separately for international aviation and marine bunker fuels.

54. Antigua and Barbuda reported information on the uncertainty assessment (level) of its national GHG inventory. The uncertainty analysis was based on the tier 1 approach 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 39.6 per cent. The TTE commends Antigua and Barbuda for providing in its BUR detailed information on the selected uncertainty values for AD and EFs.

55. The TTE noted that the transparency of the information reported on GHG inventories could be enhanced by addressing the areas noted in paragraphs 24, 30–32, 37, 41, 43, 46–47 and 52–53 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

56. As indicated in table I.2, Antigua and Barbuda 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.

57. The information reported provides a comprehensive overview of the Party's mitigation actions and their effects. In its BUR, Antigua and Barbuda reported information on its national context and framed its national mitigation planning and actions in the context of its national adaptation and mitigation targets for 2020, 2030 and 2050, as defined in its NDC. Antigua and Barbuda's NDC includes unconditional commitments to enhance the

established legal, policy and institutional environment to enable a low-carbon development pathway and to update the building code by 2020. Additionally, the NDC defines conditional mitigation and adaptation targets by sector, including establishing efficiency standards for imported vehicles by 2020, achieving an energy mix with 50 MW of electricity from renewable sources by 2030 and increasing seawater desalination capacity by 50 per cent compared with the 2015 level by 2050.

58. Antigua and Barbuda reported that its climate change targets align with the national strategic objectives defined in its 2016–2020 Medium-Term Development Strategy and identified wider impacts and co-benefits for all reported mitigation actions. The Party provided in its BUR detailed information on sectoral policies and mitigation actions for the energy supply, fuel combustion, LULUCF, agriculture and waste sectors. Most of the mitigation actions are in the energy supply and fuel combustion sectors.

59. Antigua and Barbuda included in its BUR GHG emission projections until 2030, which were developed using the Long-range Energy Alternatives Planning System software under six different scenarios (two ‘business as usual’ scenarios and four mitigation scenarios). According to the projections presented, the Party’s GHG emissions are expected to increase by approximately 80 per cent between 2015 and 2030 if the impact of the implemented and ongoing mitigation actions is not considered. The projection results indicate that implementing mitigation strategies could limit the increase in GHG emissions to approximately 8 per cent between 2015 and 2030 for the energy sector.

60. It was not clear to the TTE how the reported scenarios and emission reductions indicated by projections match the mitigation actions and their effects reported in the BUR. During the technical analysis, the Party indicated that these projections were calculated for the development of the intended nationally determined contribution and are not fully consistent with the mitigation actions described in the BUR. Furthermore, the Party emphasized that further technical capacity is needed in the country regarding the development of GHG emission projections.

61. The Party reported a summary of its sectoral mitigation actions in tabular format in accordance with decision 2/CP.17, annex III, paragraph 11. Specifically, Antigua and Barbuda included summary tables in the relevant sections of BUR chapter 4, complemented by more detailed information in annex A to the BUR. The Party also reported information on its mitigation actions in narrative format.

62. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Antigua and Barbuda clearly reported the names and descriptions of mitigation actions or groups of actions, coverage (sector and gases) and progress indicators in annex A to the BUR. The information provided includes variables such as the type of action (cross-cutting, mitigation or adaptation), adaptation and mitigation priority (low, medium or high), implementation period, responsible institution, type of policy instrument, related targets and strategies and related indicators. This information was complemented by a list of mitigation indicators (annex B to the BUR).

63. Information on quantitative goals for mitigation actions was not reported in Antigua and Barbuda’s BUR. During the technical analysis, the Party clarified that it did not consider reporting on quantitative goals of mitigation actions when preparing the BUR.

64. Antigua and Barbuda reported information on methodologies and assumptions, the objectives of the actions and their status of implementation (under implementation, in the planning phase, completed action or idea) for all mitigation actions in the energy supply, fuel combustion, LULUCF, agriculture and waste sectors.

65. The mitigation actions in the energy supply sector of Antigua and Barbuda were presented within the framework of two NDC 2030 targets: to achieve an energy mix with 50 MW of electricity from renewable sources and to ensure that 100 per cent of electricity demand related to the water sector and other essential services is met by off-grid renewable sources. The information reported for the energy supply sector covers nine mitigation actions (six under implementation and three in the planning stage) which are mainly focused on the area of renewable energy. An estimated mitigation impact was reported for only one mitigation action, a component of a sustainability project focusing on protected areas and renewable energy, with an estimated emission reduction of 100,000 t CO₂ eq by 2030.

Considering its allocated budget and co-benefits, the most significant action in the energy supply sector involves the sustainable and integrated management of water resources, which aims to achieve a consistent water supply for the people of Antigua and Barbuda. The action is currently in the planning phase.

66. The mitigation actions in the fuel combustion sector of Antigua and Barbuda focused mainly on energy efficiency in transport, buildings and civil infrastructure. The information reported for the fuel combustion sector includes five mitigation actions (three under implementation and two in the planning stage). There are two key actions focused on reducing GHG emissions in the transport sector, namely an ongoing pilot project to purchase two electric school buses and install two electric charging stations and a GEF-funded project to promote low-carbon electric vehicles, which is still in the planning phase. Both projects are expected to reduce GHG emissions by promoting and adopting electric vehicle technology in road transportation.

67. Energy efficiency in buildings and civil infrastructure is being improved through ongoing and planned projects to promote reduced energy use, including a regional project entitled Energy for Sustainable Development in the Caribbean, which sets short- and long-term objectives to reduce the use of energy from fossil fuels in buildings by 20 and 50 per cent, respectively, with an estimated mitigation impact of 1,470 kt CO₂ eq by 2027. In addition, other mitigation actions in this sector involve replacing all sodium bulb streetlights with light-emitting diode bulbs.

68. The information reported in the BUR for the LULUCF sector refers to five mitigation actions (four under implementation and one in the planning stage) focused on establishing and developing protected areas, restoring areas of special biological interest and protecting wetlands and watersheds, leading to significant carbon sequestration. Considering its allocated budget and co-benefits, the most significant mitigation action in this sector is the Path to 2020 project, which aims to expand protected areas nationwide to support species conservation, while strengthening regulatory mechanisms. Implementing the mitigation actions in this sector is expected to result in various outcomes by the end of 2020, including protecting 1,719 ha land, sequestering 43,216 t CO₂ and planting 20,000 trees.

69. The information reported in the BUR for the agriculture sector refers to four mitigation actions (two under implementation, one in the planning stage and one mitigation option (categorized as an “idea”)), focused on improving agricultural and soil management practices, developing climate-resilient farming communities, developing capacity and facilitating knowledge-sharing regarding different agricultural practices. The expected outcomes related to implementing the mitigation actions in this sector include upgrading seven meteorological stations, providing grant packages to at least 10 per cent of farmer groups for building climate-resilient agriculture and establishing seven greenhouses, at a date to be determined.

70. Two mitigation actions were reported for the waste sector in the BUR, namely the Caribbean Regional Fund for Wastewater Management, which is already completed, and an action relating to the circular economy, which is still in the planning stage. The BUR did not include information on the results achieved or estimated emission reductions for the Caribbean Regional Fund for Wastewater Management. It was reported that the circular economy action is expected to reduce emissions by 472 Gg CO₂ eq, create 500 jobs and significantly reduce the amount of waste landfilled by 2039.

71. Antigua and Barbuda reported the information on methodologies and assumptions by referring to external documents without describing the methodologies followed and the assumptions made. For some mitigation actions, the Party provided links for accessing the information. However, the TTE was unable to find information through the links about methodologies and assumptions, such as for an electric school bus pilot project and a project providing grid-interactive solar systems for schools and clinics. For other actions, the Party did not include in the BUR any links for accessing the information, but instead referenced the source of the information. In addition, the Party indicated in the BUR that the methodologies and assumptions related to mitigation action on community-led renewable energy initiatives probably lead to an underestimation of emission reduction estimates.

72. During the technical analysis, the Party clarified that a consultant collected the information on methodologies and assumptions for each mitigation action using the sources cited in the BUR. Nevertheless, the country does not yet have the internal technical capacity to report on all mitigation areas as required by the BUR provisions. The Party further clarified that the country is receiving capacity-building support on MRV for mitigation actions under a CBIT project. A description of the project's objectives and main activities is provided in the BUR (pp.52–53).

73. The TTE noted that the status of implementation reported by the Party for some mitigation actions was not consistent with the specified implementation period (mitigation actions 3, 7, 11–13, 15 and 17). Antigua and Barbuda clarified that the discrepancies were due to the delay between the finalization of the report and its submission and provided updated information on the status of implementation of the mitigation actions concerned.

74. The BUR did not include any information on steps taken or envisaged to achieve the reported mitigation actions. During the technical analysis, Antigua and Barbuda clarified that DOE compiled the information on mitigation actions through interviews with lead stakeholders, which did not provide information on steps taken or envisaged to achieve the actions.

75. Antigua and Barbuda reported a list of mitigation indicators in annex B to the BUR. These indicators, which were generally linked to one or more mitigation actions, included information on expected outcomes and estimated emission reductions. During the technical analysis, the TTE noted that individual estimated mitigation impacts were not provided for every mitigation action. Furthermore, the TTE noted that most actions listed in annex A to the BUR (specifically, mitigation actions 1, 4–9, 11–12, 14–21 and 23–24) were not considered under the GHG emission projections described in BUR section 4.11.2, either directly or in an aggregated manner. The Party clarified that the list of indicators, including the mitigation impacts, was developed with the information that was available when the mitigation chapter was drafted. However, Antigua and Barbuda does not currently have the technical capacity to estimate and report the mitigation impacts of all its mitigation actions individually. Additionally, the Party clarified that the projections included in the BUR were developed by the Clean Energy Solutions Centre to inform the 2015 intended nationally determined contribution and do not capture all the information on mitigation actions contained in the BUR.

76. Antigua and Barbuda did not provide information on its involvement in international market mechanisms in its BUR. During the technical analysis, the Party explained that it has not participated in international market mechanisms owing to its small size. Further, the Party clarified that it is considering participating in international market mechanisms through regional projects.

77. Antigua and Barbuda reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that the Party is in the process of developing and designing a domestic MRV system for mitigation actions. The Party reported that to facilitate the preparation of its BUR, a climate action database was created, including a list of mitigation initiatives that contribute to the achievement of NDC targets. DOE coordinated the development of the database in collaboration with key national stakeholders. The Technical Advisory Committee, an inter-agency, multi-stakeholder organization, validated the mitigation actions and impacts across sectors. The Party explained in its BUR that these arrangements will form the basis for Antigua and Barbuda's MRV system, which is currently being designed. Furthermore, the Party reported that the new system is being developed under a CBIT project and a project on the monitoring and assessment of multilateral environmental agreements, both of which are enabling the Party to review its MRV institutional arrangements and develop guidelines for measuring, reporting and verifying information on mitigation actions.

78. The TTE noted that the transparency of the information reported on mitigation actions could be further enhanced by addressing the areas noted in paragraphs 63 and 72–76 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

79. As indicated in table I.3, Antigua and Barbuda 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.

80. Antigua and Barbuda 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. Antigua and Barbuda identified constraints and gaps regarding its GHG inventory and mitigation actions in the respective chapters of its BUR, in addition to providing updated information on the constraints and gaps identified during the development of its NC3 (relating to data collection, inadequate infrastructure, financial services sectors, private and public sector engagement and the transportation sector) in the chapter of its BUR detailing needs and support (BUR table 30).

81. Antigua and Barbuda reported USD 150,644,625 as additional financial needs for implementing the ongoing climate change projects in the country listed in BUR table 31. The Party also provided information on additional action items required to address its constraints and gaps (BUR pp.161–164).

82. Information on how each action item reported in the BUR relates to the Party's financial, technical or capacity-building needs was not clear to the TTE. During the technical analysis, Antigua and Barbuda clarified that its technical needs include developing a technology strategy and road map; carrying out a comprehensive assessment of national costs for adaptation and mitigation; elaborating its national adaptation plan; enhancing MRV processes; and developing standardized baselines to assess and monitor the impacts of adaptation and mitigation initiatives under its NDC and its climate change programme as a whole. Antigua and Barbuda's capacity-building needs include strengthening national entities' institutional and fiduciary capacity to access local and international funds and enhancing coordination among stakeholders and institutions at the regional and national level with regard to managing and delivering climate actions. The Party also reported in its BUR other needs that are related to more than one type of support (e.g. relating to both financial and technical needs).

83. Antigua and Barbuda estimated that a total of USD 34,544,093 has been committed and an additional USD 11,531,525 has been received from the GEF, the GCF, the Adaptation Fund, the United Nations Environment Programme, the Caribbean Development Bank, the Government of Italy, the Abu Dhabi Fund for Development and the International Renewable Energy Agency for implementing 13 climate change projects, which are listed in BUR table 31. The Party also reported that it faces challenges related to reporting information on its support received in accordance with decision 2/CP.17, annex III, paragraph 15, since there is currently no single database that covers every action and project that has received support.

84. Information on other types of support received (e.g. technology transfer, capacity-building and technical support) was not clearly reported in the BUR and the reason for this was not clear to the TTE. During the technical analysis, Antigua and Barbuda provided clarification by explaining how each project listed in BUR table 31 is related to technology transfer, capacity-building and technical support received. For example, the Party received technology transfer support for initiatives such as a project involving the construction of wind turbine bases, an electric school bus pilot and a project that provides grid-interactive solar systems for schools and clinics, all of which are supported by the Government of Italy. Antigua and Barbuda's capacity-building support received includes that from the GCF Enhancing Direct Access programme and a project on an integrated approach to physical adaptation and community resilience, supported by the Adaptation Fund.

85. Information on support received for the preparation of the current BUR was not reported in Antigua and Barbuda's BUR. During the technical analysis, the Party clarified that it received support amounting to USD 342,000 from the GEF. Additionally, it received support in the form of training for DOE officials and other sectoral experts.

86. Antigua and Barbuda 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, Antigua and Barbuda reported that the draft technology needs assessment is currently being considered for adoption by its Cabinet. The technology needs identified are in the water sector (e.g. solar pumping systems, rainwater harvesting, water savers), the building sector (passive house designs and site selection, best roof pitch angle, energy-efficient windows and doors) and the transport sector (improvement of road infrastructure, hybrid and electric vehicles, alternative fuel and biofuels).

87. Specific information on technology support received was not reported in Antigua and Barbuda's BUR, although the project descriptions in BUR table 31 provide some relevant information. During the technical analysis, Antigua and Barbuda clarified the matter by providing information on the projects relevant to the technology support received.

88. 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 82, 84–85 and 87 above, which could facilitate a better understanding of the information reported on needs and support received.

5. Any other information

89. Antigua and Barbuda reported some information on its existing and planned climate change initiatives that relate to stakeholder involvement in climate actions, mitigating impacts of natural disasters, environmental and social safeguards, the workforce development plan and strategy and adopting a programmatic approach for support received.

D. Identification of capacity-building needs

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

(a) Enhancing the capacity of GHG inventory experts to use notation keys in GHG inventory tables with a view to providing information on the completeness of the GHG inventory of Antigua and Barbuda;

(b) Enhancing the capacity of local data providers to collect the data required to estimate emissions from land in Barbuda, provide the data in the format required for the GHG inventory and establish a digital system for submitting the data to the GHG inventory team;

(c) Enhancing the capacity of GHG inventory experts in the IPPU sector to gather information on and report HFC emissions on a gas-by-gas basis;

(d) Enhancing the capacity of GHG inventory experts in the waste sector to use the IPCC GHG inventory software and apply splicing methods from 2006 IPCC guidelines to fill data gaps and estimate emissions from solid waste disposal sites, and assess the associated level of uncertainty;

(e) Enhancing national capacity to separately report emissions from marine bunker fuels and international aviation under the corresponding IPCC categories;

(f) Enhancing the capacity of national experts to develop GHG inventories in the IPPU and waste sectors, particularly with regard to elements such as methodological approaches, data collection and archiving;

(g) Enhancing institutional arrangements with a view to facilitating the continuous and timely preparation of GHG inventories;

(h) Strengthening the capacity of the experts involved in inventory preparation and the members of the Party's Monitoring, Evaluation and Data Management Unit to improve the national inventory management systems that are currently under development and build a national platform for ongoing inventory data collection and data analysis;

(i) Enhancing the capacity of GHG inventory experts to estimate a consistent time series back to 2010, including data collection and archiving for historical years and use of IPCC splicing methods from 2006 IPCC guidelines for recalculations;

- (j) Enhancing the capacity of local experts to use Collect Earth, thereby increasing the number of national experts who understand how to use the tool;
- (k) Enhancing national capacity to collect required data with a view to enabling the GHG inventory team to estimate emissions for categories 3.C and 3.D under the AFOLU sector;
- (l) Enhancing the technical capacity of data providers on and increasing their awareness of the relevance of data to reporting commitments, in addition to enhancing national capacity to establish confidential agreements related to data use in the GHG inventory;
- (m) Enhancing national capacity to use legal instruments to enforce or help to establish the data collection process, where necessary;
- (n) Enhancing national capacity to design and report quantitative goals of mitigation actions;
- (o) Enhancing national capacity for mitigation modelling and development of GHG emission projection scenarios that take into account the impact of mitigation actions;
- (p) Enhancing national capacity to participate in and access international market mechanisms through regional projects;
- (q) Enhancing national capacity to estimate the impact of mitigation actions;
- (r) Enhancing the capacity of the Monitoring, Evaluation and Data Management Unit and stakeholders to estimate the costs and socioeconomic impacts of mitigation actions;
- (s) Enhancing national capacity to prioritize mitigation actions in the light of the Party's national priorities;
- (t) Enhancing national capacity to systematically identify and report financial, technical and capacity-building needs related to constraints and gaps across all climate change areas (i.e. mitigation, adaptation and reporting);
- (u) Enhancing the capacity of stakeholders to understand the reporting requirements on mitigation for BURs and NCs with a view to enabling them to monitor, report and verify information on mitigation actions;
- (v) Enhancing national capacity to engage with local university staff as part of the Party's initiatives and efforts to establish a permanent and sustainable institutional arrangement for the regular preparation of NCs and BURs on a continuous basis;
- (w) Enhancing national capacity to assess the functioning of the MRV system for financial resources in the context of implementing the Party's climate change related actions and contributions;
- (x) Enhancing national capacity to create a system for identifying and evaluating the Party's nationally determined technology needs and corresponding technology action plans;
- (y) Enhancing national capacity to systematize information collection and reporting on financial resources, technology transfer, capacity-building and technical support received from the GEF, Parties included in Annex II to the Convention and other developed country Parties, the GCF and other multilateral and bilateral institutions for activities relating to climate change, including for the preparation of the BUR.

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

- (a) Development of GHG inventory, and implementation of mitigation actions and other new and ambitious actions of the Party (BUR chaps. 3.10, 4.1.5, 4.10 and 5);
- (b) Additional actions required to address gaps and constraints, such as:
 - (i) Enhancing national capacity to assess technology, human and financial capacity;

- (ii) Enhancing national capacity to facilitate education, training, public awareness, public participation, public access to information and international cooperation throughout the implementation of activities related to the Party's NDC target;
- (iii) Strengthening institutional and fiduciary capacity to enable national entities to access local and international funds;
- (iv) Enhancing coordination among stakeholders and institutions at the regional and national level in relation to managing and delivering climate actions;
- (v) Strengthening the technical and financial capacity of public, private and civil society stakeholders with regard to inclusive business development and marketing of climate change solutions.

III. Conclusions

92. The TTE conducted a technical analysis of the information reported in the first BUR of Antigua and Barbuda in accordance with the UNFCCC reporting guidelines on BURs and concludes that the information reported is partially 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 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; domestic MRV; and any other information relevant to the achievement of the objective of the Convention. During the technical analysis, additional information was provided by Antigua and Barbuda on the GHG inventory, mitigation actions and needs and support received. The TTE concluded that the information analysed is mostly transparent.

93. Antigua and Barbuda reported information on the institutional arrangements relevant to the preparation of its BURs. It has taken significant steps to establish institutional arrangements that allow for the sustainable preparation of its BURs. These include designating the roles and responsibilities of DOE as the overall coordinating entity and defining the involvement and roles of other bodies and experts under EPMA 2019. This act provides a legal basis for establishing the Party's institutional arrangements, including those related to domestic MRV. DOE is currently in the process of operationalizing its planned institutional arrangements. Securing the employment of technical staff on a regular basis is key to the Party's sustainable MRV system. Antigua and Barbuda reported that a CBIT project which is due to run from January 2020 to December 2022 is expected to further advance the development of its MRV system.

94. In its first BUR, submitted in 2020, Antigua and Barbuda reported information on its national GHG inventory for 2015. This included GHG emissions and removals of CO₂, CH₄ and N₂O for some relevant sources and sinks as well as some precursor gases. The inventory was developed on the basis of the 2006 IPCC Guidelines, and specific EFs for precursors were taken from the Revised 1996 IPCC Guidelines. The Party reported total emissions for 2015 for a number of gases, namely CO₂ (652.74 Gg CO₂ excluding land and HWP and 844.28 Gg CO₂ including land and HWP), CH₄ (1.517 Gg CH₄), N₂O (0.049 Gg N₂O) and HFCs (6.05 Gg CO₂ eq). Key categories and main gases were identified as category 1.A.1 energy industries – liquid fuels (CO₂); category 3.B.3.a grassland remaining grassland (CO₂); category 3.B.1.a forest land remaining forest land (CO₂); and category 3.B.2.a cropland remaining cropland (CO₂). Estimates of PFCs and SF₆ emissions were not provided owing to difficulties in obtaining the necessary data, as clarified by the Party in its BUR.

95. Antigua and Barbuda reported information on mitigation actions and their effects in both tabular and narrative format, including the unconditional targets defined in its NDC, to enhance the existing legal, policy and institutional environment with a view to facilitating a low-carbon development pathway and updating the building code by 2020. The conditional targets include establishing efficiency standards for imported vehicles by 2020, achieving an energy mix with 50 MW of electricity from renewable sources by 2030 and increasing

seawater desalination capacity by 50 per cent compared with the 2015 level by 2050. The Party's key mitigation actions relate to the energy supply, fuel combustion and LULUCF sectors, focusing on the areas of renewable energy, energy efficiency, transport and protected areas. The highest emission reduction was reported for the component of a sustainability project focusing on protected areas and renewable energy, with an estimated emission reduction of 100,000 t CO₂ eq by 2030. In its BUR, the Party indicated that it intends to improve its overall reporting on mitigation actions by developing and designing a domestic MRV system on mitigation and adaptation actions and described its progress in this endeavour.

96. Antigua and Barbuda provided information on key constraints and gaps and reported financial needs of an additional USD 150,644,625. The Party also reported other related needs, including holding a comprehensive assessment of national costs for adaptation and mitigation, elaborating its national adaptation plan and strengthening institutional and fiduciary capacity to access local and international funds. During the technical analysis, the Party clarified the nature of each need. Information was reported on the support received for implementing the 13 climate change projects listed in the Party's BUR. During the technical analysis, Antigua and Barbuda outlined how each project relates to the technology transfer, technical and capacity-building support received. The Party also reported that it received financial support of approximately USD 342,000 from the GEF for preparing its latest BUR, with training also provided for DOE officials and other sectoral experts. The Party further reported information on technology needs, which include solar pumping systems, rainwater harvesting, water savers and passive house designs and site selection.

97. The TTE, in consultation with Antigua and Barbuda, identified the 25 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. Antigua and Barbuda prioritized all the capacity-building needs, but organized them into high-priority needs (para. 90(a-h), (n), (q-t) and (w) above), medium-priority needs (para. 90(i-k), (o), (u) and (x-y) above) and low-priority needs (para. 90(l-m), (p) and (v) above).

Annex I

Extent of the information reported by Antigua and Barbuda 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 Antigua and Barbuda

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 2/CP.17, paragraph 41(g)	The first BUR shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available, and subsequent BURs shall cover a calendar year that does not precede the submission date by more than four years.	No	Antigua and Barbuda submitted its first BUR in March 2020; the GHG inventory reported is for 2015.
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	Antigua and Barbuda used a combination of the Revised 1996 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	Updated AD were reported for 2015.
Decision 2/CP.17, annex III, paragraph 6	Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the BUR:		
	(a) The tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF;	No	The Party did not report the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF. The Party provided IPCC worksheets for categories 3.B.3.a and 3.B.2.a, including information on carbon stock change in soils and biomass for grassland and cropland; however, the information is not comparable.
	(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.	No	The Party did not report a time series in the

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
			BUR and only reported emissions for 2015.
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).	No	
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: <p>(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);</p> <p>(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF₆).</p>	Yes	Comparable information was reported in table 3 (pp.60–63) of the BUR.
		Partly	The BUR submitted by the Party includes table 3, which provides a summary of GHG emissions and removals for 2015, reporting HFC, PFC and SF ₆ emissions, which are required to be reported in table 2 using the categories from the 2006 IPCC Guidelines. However, HFC emissions were not reported on a gas-by-gas basis and were not expressed in units of mass (Gg).
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 separate files with 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	
Decision 17/CP.8, annex, paragraph 13	Non-Annex I Parties are encouraged to describe procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories, as well as efforts to make this a continuous process, including information on the role of the institutions involved.	Partly	Information on procedures or arrangements undertaken to archive data was not reported.
Decision 17/CP.8, annex, paragraph 14	Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of: <p>(a) CO₂;</p>	Partly	CO ₂ emissions were not estimated for categories 1.A.2–1.A.5 under

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
	(b) CH ₄ ;	Partly	category 1.A (fuel combustion activities). CH ₄ emissions for categories 1.A.2–1.A.5 under category 1.A (fuel combustion activities) and CH ₄ emissions for category 4.A (solid waste disposal) were not estimated.
	(c) N ₂ O.	Partly	The Party did not report N ₂ O emissions for categories 1.A.2–1.A.5 under category 1.A (fuel combustion activities).
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:	Partly	
	(a) HFCs;	Yes	HFC emissions were reported at an aggregated level in CO ₂ eq.
	(b) PFCs;	No	Information on PFCs was not reported.
	(c) SF ₆ .	No	Information on SF ₆ was not reported.
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;	No	The Party did not report emissions of CO and did not use notation keys.
	(b) NO _x ;	No	The Party did not report emissions of NO _x and did not use notation keys.
	(c) NMVOCs.	Partly	The Party estimated NMVOC emissions only from alcoholic beverage production. NMVOC emissions were not estimated for fuel combustion categories and no explanation was provided.
Decision 17/CP.8, annex, paragraph 17	Other gases not controlled by the Montreal Protocol, such as sulfur oxides, and included in the Revised 1996 IPCC Guidelines may be included at the discretion of Parties.	No	The Party did not report emissions of sulfur oxides and did not use notation keys.

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 17/CP.8, annex, paragraph 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.	Partly	The difference between the estimates from the two approaches was reported as 11 per cent, but no explanation was provided.
Decision 17/CP.8, annex, paragraph 19	Non-Annex I Parties should, to the extent possible, and if disaggregated data are available, report emissions from international aviation and marine bunker fuels separately in their inventories:		
	(a) International aviation;	No	
	(b) Marine bunker fuels.	No	
Decision 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 did not report aggregated GHG emissions and removals.
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	The Party reported that it used the 2006 IPCC Guidelines and the IPCC software to estimate emissions, except for NMVOC estimations, where it applied the Revised 1996 IPCC Guidelines. Tier 1 approaches were used for all estimates, except those relating to CH ₄ emissions from industrial wastewater (alcohol refining industry), where a tier 2 approach was used.
	(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;		

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
	(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 and 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.	No	Notation keys were not used.
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	The Party reported that, for EFs, default uncertainty values from the 2006 IPCC Guidelines were used.
	(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 first biennial update report of Antigua and Barbuda

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 2/CP.17, annex III, paragraph 11	Non-Annex I Parties should provide information, in tabular format, on actions to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol.	Yes	
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:		

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
	(a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indicators;	Partly	Information on quantitative goals of the mitigation actions was not reported.
	(b) Information on:		
	(i) Methodologies;	Partly	The Party provided links and references to documents containing information on methodologies. However, the methodologies followed were not described in the BUR. For some actions, the methodologies are unknown.
	(ii) Assumptions;	Partly	The Party provided links and references to documents containing information on assumptions. However, the assumptions made were not described in the BUR. For some actions, the methodologies are unknown.
	(c) Information on:		
	(i) Objectives of the action;	Yes	
	(ii) Steps taken or envisaged to achieve that action;	No	No information was provided on steps taken or envisaged to achieve mitigation actions.
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Yes	
	(ii) Progress of implementation of the underlying steps taken or envisaged;	No	No information was provided on progress of implementation of the underlying steps taken or envisaged to achieve mitigation actions.
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Yes	The estimated outcomes and estimated emission reductions were described for groups of actions.
	(e) Information on international market mechanisms.	No	No information was provided in the BUR on international market mechanisms.
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 Antigua and Barbuda

<i>Decision</i>	<i>Provision of the reporting requirements</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 2/CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on:		
	(a) Constraints and gaps;	Yes	
	(b) Related financial, technical and capacity-building needs.	Yes	Only specific information on financial needs was provided. However, in the BUR chapters on the GHG inventory and mitigation actions, some references were made to technical and capacity-building needs.
Decision 2/CP.17, annex III, paragraph 15	Non-Annex I Parties should provide:		
	(a) Information on financial resources received, technology transfer and capacity-building received;	Partly	The Party provided information on financial resources received. Specific information on technology transfer and capacity-building received was not provided, although the description of the programmes and projects that received support contains some relevant information.
	(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.	Partly	The Party provided information on technical support received, but did not provide information on support received for the preparation of the current BUR.
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;	Yes	Information on nationally determined technology needs was provided.
	(b) Technology support received.	Partly	Information on technology support received was not provided, although the list of supported climate change projects includes projects related to technology.

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

Annex II

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

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

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

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

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

B. UNFCCC documents

First BUR and NIR of Antigua and Barbuda. Available at <https://unfccc.int/BURs>.

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