United Nations

Framework Convention on Climate Change

FCCC/SBI/ICA/2018/TASR.2/ARM

Distr.: General
19 March 2019

English only

# Technical analysis of the second biennial update report of Armenia submitted on 5 May 2018

## 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 (non-Annex I Parties), consistently with their capabilities and the level of support provided for reporting, were to submit their first biennial update report (BUR) by December 2014. Further, 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 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 BURs at their discretion. This summary report presents the results of the technical analysis of the second BUR of Armenia, conducted by a team of technical experts in accordance with the modalities and procedures contained in the annex to decision 20/CP.19.

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# Contents

# Abbreviations and acronyms

| | |
|---|---|
| 2006 IPCC Guidelines | *2006 IPCC Guidelines for National Greenhouse Gas Inventories* |
| AD | activity data |
| AFOLU | agriculture, forestry and other land use |
| BUR | biennial update report |
| CDM | clean development mechanism |
| $CH_4$ | Methane |
| $CO_2$ | carbon dioxide |
| $CO_2$ eq | carbon dioxide equivalent |
| EF | emission factor |
| EMEP/EEA | European Monitoring and Evaluation Programme/European Environment Agency |
| F-gas | fluorinated gas |
| GHG | greenhouse gas |
| HFC | hydrofluorocarbon |
| ICA | international consultation and analysis |
| IPCC | Intergovernmental Panel on Climate Change |
| IPCC good practice guidance | *Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories* |
| IPCC good practice guidance for LULUCF | *Good Practice Guidance for Land Use, Land-Use Change and Forestry* |
| IPPU | industrial processes and product use |
| LULUCF | land use, land-use change and forestry |
| MRV | measurement, reporting and verification |
| NA | not applicable |
| NC | national communication |
| NIR | national inventory report |
| NMVOC | non-methane volatile organic compound |
| NO | not occurring |
| non-Annex I Parties | Parties not included in Annex I to the Convention |
| $N_2O$ | nitrous oxide |
| PFC | perfluorocarbon |
| 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" |
| WAM | 'with additional measures' |
| WEM | 'with measures' |
| WOM | 'without measures' |

# 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 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 BURs. 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. Armenia submitted its first BUR on 29 April 2016, which was analysed by a TTE in the sixth round of technical analysis of BURs from non-Annex I Parties, conducted from 19 to 23 September 2016. After the publication of its summary report, Armenia participated in the fourth workshop for the facilitative sharing of views, convened in Bonn on 10 November 2018.

5. This summary report presents the results of the technical analysis of the second BUR of Armenia, 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, Armenia submitted its second BUR on 5 May 2018 as a stand-alone update report, approximately two years after the submission of its first BUR.

7. The technical analysis of the BUR took place from 20 to 24 August 2018 in Bonn 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: Ms. María José López (Belgium), Mr. Marcelo Rocha (Brazil), Mr. Alexander Valencia (Colombia), Ms. Fan Xing (China) and Mr. Oscar Zarzo Fuertes (Germany). Ms. López and Mr. Rocha were the co-leads. The technical analysis was coordinated by Ms. Karen Ortega and Ms. Ana Pejovic (secretariat).

8. 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 Armenia 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 Armenia's second BUR, the TTE prepared and shared a draft summary report with Armenia on 14 November 2018 for its review and comment. Armenia, in turn, provided its feedback on the draft summary report on 8 February 2019.

9. The TTE responded to and incorporated Armenia's comments referred to in paragraph 8 above and finalized the summary report in consultation with the Party on 20 February 2019.

[1] The consultation was conducted via teleconferencing.

# 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 chapter 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 chapter 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 chapter II.D below).

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

## B. Extent of the information reported

12. The elements of information referred to in paragraph 10(a) above include the national GHG inventory report; information on mitigation actions, including a description of such actions, an analysis of their impacts and the associated methodologies and assumptions, and the progress made in their implementation; information on domestic MRV; and information on support needed and received.

13. According to decision 20/CP.19, annex, paragraph 15(a), in undertaking the technical analysis of the submitted BUR, the TTE is to identify the extent to which the elements of information listed in paragraph 12 above have been included in the BUR of the Party concerned. The TTE considers that the reported information is mostly consistent with the UNFCCC reporting guidelines on BURs. Specific details on the extent of the information reported for each of the required elements are provided in annex I.

14. The TTE noted improvements in the reporting in the Party's second BUR compared with that in its first BUR. The reporting in the second BUR on GHG inventories, needs and support, and mitigation actions demonstrates that the Party has taken into consideration the areas for enhancing transparency noted by the previous TTE in the summary report on the technical analysis of the Party's first BUR. The TTE noted in particular that Armenia took into consideration the recommended improvement in the area of methodologies for the assessment of mitigation actions.

## C. Technical analysis of the information reported

15. The technical analysis referred to in paragraph 10(b) above aims to increase the transparency of 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.

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 BURs.

19. In its second BUR Armenia provided an update on its national circumstances, including a description of national and regional development priorities and information on features of its geography and economy that might affect the country's ability to deal with mitigating and adapting to climate change. A significant temperature increase has been observed in recent decades: the annual average ambient air temperature increased by 0.4 °C in the period 1929–1996, by 0.85 °C in the period 1929–2007 and by 1.2 °C in the period 1929–2016. A decreasing trend can be observed for precipitation: annual average precipitation decreased by 6 per cent in the period 1935–1996 and by almost 9 per cent in the period 1935–2016. Armenia is characterized by hazardous hydrometeorological phenomena that cause significant losses to the population and the economy.

20. In addition, Armenia provided a summary of relevant information regarding its national circumstances in tabular format and some graphs illustrating the institutional arrangements for the preparation of its NCs and BURs.

21. Armenia transparently described in its BUR the existing institutional arrangements relevant to the preparation of its NCs and BURs on a continuous basis. In 2012, Armenia established an Inter-agency Coordinating Council for meeting the requirements of the UNFCCC. The Council is composed of representatives of 13 ministries, three State agencies adjunct to the Government and two independent bodies, namely the Armenian Public Services Regulatory Commission and the Armenian National Statistical Service. The chairperson of the Council is the Minister of Nature Protection. The Council provides high-level support and policy guidance, thus ensuring the sustainability of the preparation of the Party's NCs and BURs. To support the Council in fulfilling reporting requirements, including the process of producing GHG inventories, a working group was also established, comprising representatives of the aforementioned ministries and State agencies as well as climate change experts and consultants. The Ministry of Nature Protection is responsible for coordinating activities related to the development of the Party's NCs and BURs, including the GHG inventory, through the Division on Climate Change and Atmospheric Air Protection of the Environmental Protection Policy Department.

22. The agencies involved in the preparation of Armenia's BURs are the Ministry of Nature Protection; the Ministry of Energy Infrastructures and Natural Resources; the Ministry of Agriculture; the Ministry of Transport, Communication and Information Technologies; the Ministry of Economic Development and Investments; the Ministry of Emergency Situations; the State Committee of Real Estate Cadastre; the Public Services Regulatory Commission; and the National Statistical Service.

23. In December 2016, Armenia approved the concept of a draft law on atmospheric air protection, whereby it envisages setting up a unified system for recording hazardous substances and GHG emissions, which will help the Party to comply with its reporting obligations and provide consistent information under different environmental conventions. A draft law on government structure and activity is currently under development, which stipulates that, among other obligations, the Ministry of Nature Protection shall be responsible for the development and implementation of government policies on preventing or reducing negative impacts of climate change.

24. Armenia transparently reported on its proposed domestic MRV system, planned to be established in 2019 under the coordination of the Ministry of Nature Protection, covering MRV of GHG emissions, MRV of mitigation and adaptation actions, and MRV of support

(finance, technology transfer and capacity-building). The proposed MRV arrangements would be implemented gradually, building on national circumstances and existing local capacity and taking into account best practices of other countries. Institutional reforms are envisaged, aimed at coordinating all activities related to the preparation of NCs and BURs, including establishing legal or formal arrangements for data collection, identifying common approaches to assessing mitigation actions, and creating procedures for verification and archiving of information.

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

25. As indicated in table 1 in annex I, Armenia 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. Armenia submitted its second BUR in 2018, covering in detail 2013–2014 and providing information on its 1990 and 2000–2012 GHG inventories, which is consistent with the requirements for the reporting time frame.

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

28. GHG emissions and removals were estimated using mainly tier 1 methodology from the 2006 IPCC Guidelines. In the case of key categories, tier 2 and 3 methodologies were applied for 10 out of the 15 key categories identified. Tier 3 methods were used for estimating $CO_2$ emissions from electricity generation and cement production. Tier 2 methods were used for estimating emissions from stationary and mobile combustion of natural gas, fugitive $CH_4$ emissions from natural gas, HFC emissions from refrigeration and air conditioning (method 2a), $CH_4$ emissions from enteric fermentation of cattle, net $CO_2$ removals from forest land remaining forest land, and $CH_4$ emissions from solid waste disposal.

29. With regard to the methodologies used, information was clearly reported, including sources of AD and EFs and description of tier levels. Detailed information on each category was provided in the NIR, including a description of the category; an overview of emission shares and trends; a description of methodological issues; sources of data used (EFs, AD and other parameters); uncertainty analysis; time-series consistency; source-specific quality assurance/quality control; source-specific recalculations; and source-specific planned improvements and recommendations. The TTE commends Armenia for its efforts to report GHG emissions in a transparent manner.

30. Information on the Party's total GHG emissions by gas in 2014 is outlined in table 1. It shows a decrease in emissions of 59.5 per cent (15 Mt $CO_2$ eq) since 1990. Information on emissions of HFCs, PFCs and $SF_6$ was included in the Party's reporting; however, during the technical analysis the Party highlighted that such reporting will be improved for its next BUR as the emissions are becoming increasingly relevant.

[2] https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-update-reports-non-annex-i-parties/biennial-update-report-submissions-from-non-annex-i-parties.

Table 1
**Greenhouse gas emissions by gas of Armenia in 2014**

| *Gas* | *GHG emissions (Gg) including AFOLU* | *% change 1990–2014* | *GHG emissions (Gg) excluding AFOLU* | *% change 1990–2014* |
|---|---|---|---|---|
| $CO_2$ | 5 145.8 | Not provided | 5 626.1 | Not provided |
| $CH_4$ | 156.8 | Not provided | 164.8 | Not provided |
| $N_2O$ | 2.7 | Not provided | 2.69 | Not provided |
| HFCs | 531.7 | Not provided | 531.7 | Not provided |
| PFCs | NO | NA | NO | NA |
| $SF_6$ | NO | NA | NO | NA |
| **Total** | **10 450.7 ($CO_2$ eq)** | **–60.2*** | **9 973.6 ($CO_2$ eq)** | **–59.5**[a] |

[a] Data on the per cent change of the GHG emissions, including and excluding AFOLU, are reported in the second BUR: in 1990 total GHG emissions including AFOLU were 25,770.7 Gg $CO_2$ eq, and total GHG emissions excluding AFOLU were 25,034.7 Gg $CO_2$ eq.

31. Other emissions reported include 12.4 Gg nitrogen oxides, 22.3 Gg carbon monoxide, 10.2 Gg NMVOCs and 39.0 Gg sulfur dioxide.

32. Armenia applied notation keys in tables where numerical data were not provided, consistently with the 2006 IPCC Guidelines. However, explanation of their use was not included in the BUR. The TTE noted that the inclusion of relevant clarification in the BUR could facilitate a better understanding of the notation keys used.

33. Armenia used the 2006 IPCC Guidelines for its reporting and partially reported comparable information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF, as information was provided at the aggregate level, and reported comparable information addressing the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines.

34. The shares of emissions that different sectors contributed to the total GHG emissions in 2014 as calculated by the TTE using information from the BUR are reflected in table 2.

Table 2
**Shares of greenhouse gas emissions by sector of Armenia in 2014**

| *Sector* | *GHG emissions (Gg $CO_2$ eq)* | *Share (%)* | *Change (%) 1990–2014* |
|---|---|---|---|
| Energy | 7 012.3 | 70.3 | –69.1 |
| AFOLU (net) | 1 567.6 | 15.7 | 25.1 |
| Industrial processes | 782.5 | 7.9 | 24.3 |
| Waste | 611.2 | 6.1 | 39.2 |

35. For the energy sector, information was not clearly reported on fugitive emissions, particularly on the very high losses incurred in the transmission and distribution of natural gas (5.9 per cent in 2014). During the technical analysis, the Party clarified that fugitive emissions were assessed by applying country-specific EFs and that the infrastructure for natural gas transmission and distribution is, as described by Armenia, "very old and in a bad state of conservation", which could explain the high losses and emissions reported.

36. For industrial process emissions, Armenia reported emissions from the source categories mineral industry (2.A), metal industry (2.C), non-energy products from fuels and solvent use (2.D), product uses as substitutes for ozone-depleting substances (2.F) and other (food and beverage industry) (2.H). AD for the food and beverage industry were not reported. For cement production, emission estimates for clinker production were divided between cement production and non-cement clinker production. During the technical analysis, Armenia clarified that the reporting on the emissions from clinker production was done in a disaggregated manner in the NIR only for the purpose of being coherent with the cement

production statistics. The TTE noted that including only data on clinker production (and not cement production) or clarifying the reasons of this disaggregation in the NIR would increase the transparency of the reporting.

37. During the technical analysis Armenia clarified that there is no significant chemical industry in Armenia, particularly not any that generates GHG emissions. It also clarified that AD for the food and beverage industry are publicly available. It further clarified that the HFC and $SF_6$ emission estimates may not be complete as there are no statistics on the consumption and use of F-gases, and the AD are derived from import numbers provided by the country's customs services. The TTE noted that the Party clarifying the information sources for the data on the food and beverage industry, explaining the absence of chemical industry in the country and the reason it was reported as "NO", and further clarifying the possibility of other emissions occurring from the consumption of HFCs, PFCs and $SF_6$ in the BUR could facilitate a better understanding of the information reported.

38. For the AFOLU sector, Armenia divided emissions between two subsectors: agriculture, and forestry and other land use. For the agriculture subsector, $CH_4$ from enteric fermentation, direct $N_2O$ from managed soils and indirect $N_2O$ from managed soils were identified as key categories and the most relevant emissions sources in the subsector. Armenia used national EFs for estimating GHG emissions from enteric fermentation and EFs from the 2006 IPCC Guidelines for all other categories. Information on livestock based on national statistics and expert judgment was provided. Information was not reported on emissions from manure management of rabbits, although livestock numbers were reported. During the technical analysis, Armenia clarified that the national statistics do not provide accurate livestock numbers so expert judgment was used. It also clarified that national statistics on rabbits have only been available since 2013 so the associated emissions from manure management will be estimated for the next BUR. The TTE noted that Armenia clarifying information on livestock statistics used as AD and reporting on manure management of rabbits could facilitate a better understanding of the information reported.

39. For the forestry and other land use subsector, $CO_2$ from forest land remaining forest land was identified as a key category. Information was not clearly reported on land classification as there is a mismatch of categories between the Armenian and IPCC land classification systems. Further, the category harvested wood products was reported as "NA". During the technical analysis, Armenia clarified that it faces constraints, due to differences in categories between the Armenian and IPCC land classification systems, in estimating emissions from forestry and other land use. The TTE noted that Armenia clarifying its land classification and the constraints on its reporting on emissions from harvested wood products in the BUR could facilitate a better understanding of the information reported.

40. For the waste sector, $CH_4$ emissions from solid waste disposal sites and wastewater treatment and discharge were identified as key categories. Armenia reported that all municipal solid waste generated in rural areas is openly burned. The category biological treatment of solid waste was reported as "NO". During the technical analysis, Armenia explained that composting only occurs at a local and very limited level so the associated emissions were not estimated. Further, Armenia acknowledged the lack of accurate data available on waste management practices in rural areas. The TTE noted that Armenia explaining that there is a lack of accurate information on waste management practices in rural areas as well as why biological treatment of solid waste is a negligible source of emissions in the country could facilitate a better understanding of the information reported for this sector.

41. The NIR, as a technical annex to the BUR, contains information that provides an update of the Party's first BUR, which addressed anthropogenic emissions and removals for 2011–2012. The update was carried out for 2013–2014, and emissions for the time series 2000–2012 as well as for 1990 were recalculated using a mix of country-specific methodologies and methodologies from the 2006 IPCC Guidelines, thus generating a consistent 15-year time series. Additionally, a summary information table was provided for 1990, the base year for the assessment of mitigation actions. However, 1994–1999 were not reported. In response to a request from the TTE for technical clarification, Armenia explained that sufficient detailed data for conducting recalculations for the years before 2000 were not

available. Further, it clarified that 1994–1999 were not representative years for Armenia as the economy in that period was in transition from a planned to a market economy.

42. Armenia described in its BUR the institutional framework for the preparation of its 2013–2014 GHG inventory. The Ministry of Nature Protection is responsible for coordinating the Party's activities related to the development of its NCs and BURs, including the GHG inventory, which was prepared with the support of the United Nations Development Programme, which assisted Armenia in forming its GHG inventory expert group, which worked in close cooperation with the Ministry of Nature Protection. During the technical analysis, Armenia clarified that documentation and archiving systems are also in place. The TTE noted that Armenia including information in the BUR on documentation and archiving related to the GHG inventory could facilitate a better understanding of the information reported.

43. Armenia reported a key category analysis performed for the level of emissions. During the technical analysis, Armenia clarified that a key category analysis was not performed for the trend in emissions owing to lack of technical capacity.

44. The BUR provides information on quality assurance/quality control measures for the energy, AFOLU and waste sectors.

45. The Party reported information on $CO_2$ emissions from fuel combustion using both the sectoral and the reference approaches. Armenia mentioned that the difference between the approaches (approximately 4 per cent) can be explained by the fact that natural gas leakage from pipelines and the gas company's own gas consumption are included in apparent consumption in the reference approach estimate.

46. Information was reported on international aviation; however, since Armenia is a landlocked country, it did not report information on marine bunker fuels.

47. Armenia reported information on its use of global warming potential values consistent with those provided by the IPCC in its Second Assessment Report based on the effects of GHGs over a 100-year time-horizon.

48. Armenia 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 key source categories and all direct GHGs. The results obtained, as reported in the BUR, reveal that the level uncertainty for emissions ranges from 231.2 per cent for indirect $N_2O$ emissions from managed soils to 4.2 per cent for emissions from electricity and combined heat and power generation for gaseous fuels. Armenia did not report a total national uncertainty, so the uncertainty level for total emissions with and without LULUCF or AFOLU cannot be estimated. Armenia stated during the technical analysis that the uncertainty assessment will be improved for its next BUR.

49. The TTE noted that the transparency of the information reported could be further enhanced by the Party addressing the areas referred to in paragraphs 35–42 and 48 above, which could in turn enable the TTE to better understand the information reported.

50. In paragraphs 30, 32 and 35 of the summary report on the technical analysis of Armenia's first BUR, the previous TTE noted where the transparency of the reporting on F-gases, time-series consistency and uncertainty assessment could be enhanced. The current TTE noted that Armenia took into consideration these areas for improvement in its second BUR. The Party provided equivalent and disaggregated data on F-gases in table 2.3 on page 12 of its second BUR in accordance with the reporting format of table 2 contained in the annex to decision 17/CP.8. Further, the TTE noted that Armenia provided a more detailed description of the uncertainty assessment for key sources in table 1.3 on page 7 of the BUR. The TTE commends the Party for enhancing the transparency of the information reported.

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

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

52. The information reported provides a clear and comprehensive overview of the Party's mitigation actions and their effects. In its BUR Armenia framed its national mitigation planning and actions in the context of the national security strategy, which aims to ensure energy security through the provision of affordable and reliable energy by developing nuclear energy, investing in renewable energy and enhancing energy efficiency. Most of the mitigation actions are in the energy sector and target enhancing energy savings and renewable power generation. Mitigation actions in other sectors, including forestry, waste, IPPU and agriculture, were also reported in the BUR, including information on progress of implementation and GHG emission reduction targets. Armenia reported that the key role of the energy sector is highlighted in the national development strategy. There are a number of strategies and action plans to develop the energy sector with a view to achieving economic growth, poverty reduction and national security. The implemented mitigation actions contributed to estimated emission reductions of 239 Gg $CO_2$ eq in the period 2013–2014, with the energy sector being the main source of emission reductions.

53. The Party reported a summary of its mitigation actions in tabular format in accordance with decision 2/CP.17, annex III, paragraph 11, including measures associated with renewable power generation, energy efficiency, sustainable transportation, green cities, sustainable agriculture, carbon stocks and waste management.

54. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Armenia reported for its mitigation actions name, coverage (sector and gases), quantitative goals and progress indicators in table 3.1 of its BUR. The Party reported that its mitigation measures were derived from projects that are implemented, ongoing or planned. However, the TTE noted that quantitative goals were not reported in the BUR for some mitigation actions in the energy sector (such as the Sustainable Energy Finance Project of Armenia and the International Finance Corporation on page 54 and Bright Border on page 58 of the BUR) or for any actions in the forestry sector (such as the three projects listed on page 63 of the BUR). During the technical analysis, Armenia clarified that the mitigation actions concerned did not have quantitative goals related to GHG emission reduction but other types of quantitative indicators and qualitative goals not applicable to the table. The TTE noted that the Party including information in the BUR on mitigation actions' quantitative goals related to GHG emission reduction could facilitate a better understanding of the information reported.

55. There were 28 mitigation actions reported for the energy sector, most of which are associated with promoting renewable energy generation capacity and increasing energy savings. One example is Armenia's Energy Efficiency Project, successfully implemented from 2012 to 2016 and achieving by 2017 annual energy savings (for both electricity and natural gas) of 450 GWh and a 163.3 Gg $CO_2$ eq emission reduction. The energy intensity of the gross domestic product is anticipated to be reduced by 24 per cent by 2030 compared with the 2012 level (from 0.3 toe/USD thousand in 2012 to 0.2 toe/USD thousand in 2030) thanks to the contribution of implemented mitigation actions. Information (name, description, methodology, assumptions and estimated outcomes) was also provided on 12 additional mitigation actions on both the generation and the demand side.

56. In its second BUR Armenia reported three different mitigation scenarios for the energy sector: WOM, WEM and WAM. The WOM scenario was considered in order to assess the risk of GHG emission growth in case the construction of the new nuclear plant is delayed and the growing demand is met by the construction of new thermal power plants without the provision of new renewable constructions. Under the WOM scenario total GHG emissions of 14,636 Gg $CO_2$ eq were projected for 2030; under the WEM scenario, 10,243 Gg $CO_2$ eq; and under the WAM scenario, 9,230 Gg $CO_2$ eq. The WEM scenario includes mitigation actions that are highly likely to be implemented, which have already been started or are planned with different timelines in the near future, with estimated emission reductions of 1,732 Gg $CO_2$ eq by 2025 and 4,393 Gg $CO_2$ eq by 2030. The WEM scenario also includes large-, medium- and small-scale mitigation measures, on the generation and demand side, including renewable energy and energy efficiency projects. The WAM scenario includes planned mitigation actions that have not yet secured financing, with estimated emission reductions of 2,475 Gg $CO_2$ eq by 2025 and 5,406 Gg $CO_2$ eq by 2030. The WAM scenario also includes the more ambitious development of renewable energy sources and enhanced implementation of energy efficiency measures.

57. Armenia described two mitigation actions related to the IPPU sector, aimed at improving dust capture efficiency in the cement industry and developing a HFC phase-out plan, respectively. During the technical analysis, Armenia clarified that, in the energy sector, emission reductions are due to the installation of new energy-efficient equipment; while in the IPPU sector emission reductions are due to increased dust capturing and recycling in the kiln.

58. Armenia reported four mitigation actions for the forestry sector, involving afforestation, reforestation, pest control and creating specific forest conditions for $CO_2$ removals. Forest pest control was implemented on 157 ha land and led to the avoidance of 30.7 Gg emissions in 2013–2014. Armenia reported a measure for increasing $CO_2$ removals through afforestation and reforestation with annual $CO_2$ removals in 2015 of 0.4 Gg. The assessment of $CO_2$ removals resulting from mitigation actions in the forestry sector was conducted using a methodology from the 2006 IPCC Guidelines.

59. For the waste sector, four ongoing or planned mitigation actions were reported associated with improving infrastructure and developing waste management. Solid waste management in the city of Yerevan is expected to yield the highest level of emission reductions, namely 140 Gg $CO_2$ eq by 2021. Underlying assumptions were reported, but not in detail, for the Kotayk and Gegharkunik solid waste management project and solid waste management in Yerevan. During the technical analysis, the Party confirmed that the assumptions used for assessing those two projects were consistent with the relevant assumptions of the European Bank for Reconstruction and Development.

60. Armenia provided information on its involvement in international market mechanisms as a Party to the Kyoto Protocol. The TTE noted one reported CDM project in the waste sector, but the Party has six registered CDM projects. During the technical analysis, the Party clarified that it does have six registered CDM projects but five had not been issued certified emission reductions and were therefore not reported. The TTE noted that the Party including more information in the BUR on CDM projects could facilitate a better understanding of the information reported.

61. Armenia reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that Armenia is in the process of developing and designing a domestic MRV system for mitigation actions. The Party outlined the steps on an envisaged pathway to establishing an MRV system for mitigation actions, including establishing institutional arrangements and processes, defining mitigation impact assessment methodologies, identifying data providers, defining reporting obligations and verifying compliance.

62. The TTE noted that the transparency of the information reported could be further enhanced by the Party addressing the areas referred to in paragraphs 54 and 60 above, which could in turn enable the TTE to better understand the information reported.

63. In paragraphs 41, 43, 44 and 45 of the summary report on the technical analysis of Armenia's first BUR, the previous TTE noted where the transparency of the reporting on methodologies and assumptions used for the non-energy sectors and time frames for ongoing and planned actions could be further enhanced. The current TTE noted from the second BUR that Armenia took into consideration the improvement in the area of methodologies, and commends the Party for enhancing the transparency of the information reported.

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

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

65. Armenia reported information on constraints and gaps, and related financial, technological and capacity-building needs in accordance with decision 2/CP.17, annex III, paragraph 14. Armenia identified as constraints the lack of formal arrangements for data collection, the lack of complete and reliable data and the absence of a comprehensive MRV framework. Armenia reported that its financial, technological and capacity-building needs

are primarily in the areas of preparing NCs and BURs, improving reporting on GHG removals from forest land, identifying mitigation actions in the non-energy sectors, developing feasibility studies and supporting the application of energy-efficient advanced technologies.

66. Armenia reported information on financial resources, technology transfer, capacity-building and technical support received in accordance with decision 2/CP.17, annex III, paragraph 15. It reported that it received USD 11.3 million from the Global Environment Facility, which included allocation for both its first BUR and its NC3 and NC4. The information reported also indicates that Armenia received capacity-building and technical support from the United Nations Development Programme to facilitate its use of the 2006 IPCC Guidelines to prepare its GHG inventory.

67. Armenia did not report 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. It reported that its technology needs assessment was nationally determined, without mentioning the results of the assessment. During the technical analysis, Armenia clarified that, although a technology needs assessment was conducted, the results did not clearly indicate any needs and therefore there are plans to conduct a new assessment. The TTE noted that the Party including in its BUR information on the results of its technology needs assessment or its plans to conduct a new one could facilitate a better understanding of the information reported.

### 5. Any other information

68. Armenia reported information on a project with the objective of strengthening the capacity to use environmental education and awareness-raising as tools for addressing natural resource management issues with a view to achieving GHG emission reductions.

## D. Identification of capacity-building needs

69. In consultation with Armenia, the TTE identified the following needs for capacity-building that could facilitate the Party's preparation of subsequent BURs and participation in ICA:

(a) Further strengthening the technical capacity of institutions and experts at the national level for preparing national GHG inventories on a continuous basis, including improving the GHG emission estimates for the IPPU and waste sectors and the emission and removal estimates for the AFOLU sector;

(b) Further enhancing the national technical capacity to estimate F-gas emissions;

(c) Further enhancing the national technical capacity to conduct key category analysis trend assessment;

(d) Developing formal institutional arrangements to set up a permanent GHG inventory team and to collect and validate AD and establish a database to support the development of GHG inventories on a sustainable and continuous basis;

(e) Further enhancing the capacity of the National Statistical Service as the provider of livestock data to generate more accurate numbers;

(f) Further strengthening the national capacity to conduct uncertainty assessment of emissions and removals;

(g) Enhancing the mitigation analysis and the identification of the quantitative goals of mitigation actions in the non-energy sectors, especially waste and forestry;

(h) Further enhancing the identification of mitigation actions' social and economic co-benefits;

(i) Establishing the domestic MRV system, including the specific working group on MRV of mitigation actions to regularly track their progress;

(j) Developing procedures and institutional arrangements for data management to collect information related to financial, technological and capacity-building needs as well as financial resources, technology transfer, capacity-building and technical support received;

(k) Further strengthening the technical capacity of national institutions and experts to determine technology needs.

70. The TTE noted that, in addition to those identified during the technical analysis, Armenia reported the following capacity-building need in its BUR: further strengthening the technical capacity of domestic institutions and experts to prepare national GHG inventories on a continuous basis, including developing additional country-specific EFs and applying higher-tier methodologies, improving GHG emission and removal estimates for the AFOLU sector, further enhancing the uncertainty assessment of emissions and removals, conducting key category analysis trend assessment, developing formal and institutional arrangements for collecting and validating AD and setting up a database to enable the development of GHG inventories on a sustainable and continuous basis, conducting GHG mitigation analysis for non-energy sector development plans and programmes and establishing the domestic MRV system.

71. In paragraph 54 of the summary report on the technical analysis of Armenia's first BUR, the previous TTE, in consultation with Armenia, identified capacity-building needs. In its second BUR Armenia reflected that some of those capacity-building needs have been addressed: developing additional country-specific EFs and applying higher-tier methodologies, especially for the key category analysis for the subcategories of electricity generation and combined heat and power generation; further enhancing the accuracy and completeness of the GHG inventory by analysing data for subcategories (Armenia introduced data for 14 relevant subcategories of manufacturing industries and construction, off-road transportation, glass production, non-cement clinker production, $CO_2$ and nitrogen emissions from wetlands, and emissions from biomass burning on grassland); and enhancing the completeness and transparency of the reporting on the methodologies used for estimating the GHG impact of mitigation actions in the non-energy sectors.

# III. Conclusions

72. The TTE conducted a technical analysis of the information reported in the second BUR of Armenia in accordance with the UNFCCC reporting guidelines on BURs. The TTE concludes that the reported information is mostly consistent with the UNFCCC reporting guidelines on BURs and 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 removal by sinks of all GHGs not controlled by the Montreal Protocol, including an NIR; mitigation actions and their effects, including associated methodologies and assumptions; constraints and gaps and related financial, technological and capacity-building needs, including a description of support needed and received; the level of support received to enable the preparation and submission of BURs; domestic MRV; and any other information relevant to the achievement of the objective of the Convention. On 17 August 2018, during the technical analysis, additional information was provided by Armenia. The TTE concluded that the information analysed is mostly transparent.

73. Armenia reported transparent information on the institutional arrangements relevant to the preparation of its BURs. The Ministry of Nature Protection is responsible for coordinating the activities related to the development of the Party's NCs and BURs, including the GHG inventory, through the Division on Climate Change and Atmospheric Air Protection of the Environmental Protection Policy Department, established in 2015. The Division is responsible for coordinating the development of the NCs and BURs to ensure that the information is consistent, complete and submitted on time.

74. In its second BUR, submitted in 2018, Armenia reported information on its national GHG inventory for 2013–2014 and provided information on its 1990 and 2000–2012 inventories. This included GHG emissions and removals of $CO_2$, $CH_4$, $N_2O$ and F-gases 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 2014 were reported as 9,973.6 Gg $CO_2$ eq (excluding AFOLU) and 10,450.7 Gg $CO_2$ eq (including AFOLU). A total of 15 key categories were identified, with $CO_2$ and electricity and heat production identified as the main gas and key category, respectively.

75. Armenia reported information on mitigation actions and their effects, including a clear and comprehensive overview of its mitigation actions, framed in the context of the national security strategy, which aims to ensure energy security through the provision of affordable and reliable energy by developing nuclear energy, investing in renewable energy and enhancing energy efficiency. Armenia reported mitigation actions that are planned, ongoing or completed, covering all sectors, including energy, IPPU, agriculture, forestry and waste. The key mitigation actions focus on the energy sector and on energy saving, renewable power generation and emission reduction. Armenia reported estimated emission reductions to be achieved as a result of all its implemented mitigation actions of 1,732 Gg $CO_2$ eq by 2025 and 4,393 Gg $CO_2$ eq by 2030. It also reported in its BUR on the construction of a new nuclear power plant as a mitigation action in the energy sector, which is expected to result in emission reductions of 2,359 Gg $CO_2$ eq by 2030.

76. Armenia reported transparent information in tabular format in its BUR on key constraints, gaps and related financial and capacity-building needs. The Party reported the absence of a comprehensive MRV framework as a constraint. Information on support needed and received was also reported transparently. The capacity-building needs are primarily in the areas of preparing NCs and BURs, identifying mitigation actions for the non-energy sectors and developing feasibility studies of energy-efficient advanced technologies. Information on technology needed and received was not reported in the BUR. During the technical analysis, Armenia provided additional information on the key challenges faced in translating its identified needs into technology needs. It clarified that, although a technology needs assessment was conducted, the results did not clearly indicate any needs and therefore there are plans to conduct a new assessment.

77. The TTE, in consultation with Armenia, identified 11 capacity-building needs, listed in chapter II.D above, which 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. Armenia identified the following as its priority capacity-building needs:

(a) Further enhancing the national technical capacity to conduct key category analysis trend assessment;

(b) Establishing the domestic MRV system, including the specific working group on MRV of mitigation actions to regularly tracking their progress;

(c) Developing procedures and institutional arrangements to collect information related to financial, technological and capacity-building needs and financial resources, technology transfer, capacity-building and technical support received.

# Annex I

## Extent of the information reported by Armenia in its second biennial update report

Table 1
**Identification of the extent to which the elements of information on greenhouse gases are included in the second biennial update report of Armenia**

| *Decision* | *Provision of the reporting guidelines* | *Yes/partly/ no/NA* | *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 | Armenia submitted its second BUR in May 2018; the GHG inventory reported is for 2013–2014. |
| 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 | Armenia used the 2006 IPCC Guidelines. |
| Decision 2/CP.17, annex III, paragraph 5 | The updates of the section on national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol should contain updated data on activity levels based on the best information available using the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF; any change to the EF may be made in the subsequent full NC. | Yes | Updated data on activity levels for 2013 and 2014 were included in the NIR submitted in conjunction with Armenia's second BUR. |
| 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; | Partly | Armenia did not include the tables or comparable information, although information on LULUCF was provided at an aggregate level in table 4.62. |
| | (b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines. | Yes | Comparable information was reported. |
| Decision 2/CP.17, annex III, paragraph 7 | Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in its previous NCs. | Partly | The time series reported in the BUR did not include the years 1994–1999, although they were included in the Party's NC1 and NC2. |
| 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 | Information was reported for 1990 but not for 1994–1999. |

| *Decision* | *Provision of the reporting guidelines* | *Yes/partly/ no/NA* | *Comments on the extent of the information provided* |
|---|---|---|---|
| Decision 2/CP.17, annex III, paragraph 9 | The inventory section of the BUR should consist of 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: | | |
| | (a) Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors); | Yes | Comparable information was reported in table 2.2. |
| | (b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and $SF_6$). | Yes | Comparable information was reported in table 2.3. |
| Decision 2/CP.17, annex III, paragraph 10 | Additional or supporting information, including sector-specific information, may be supplied in a technical annex. | Yes | Armenia submitted an NIR as an annex to its BUR. |
| 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 | Armenia did not fully describe its procedures and arrangements for documentation and archiving of data in its BUR. |
| Decision 17/CP.8, annex, paragraph 14 | Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of: | | |
| | (a) $CO_2$; | Yes | |
| | (b) $CH_4$; | Yes | In the summary tables, $CH_4$ emissions were reported in units of mass only. |
| | (c) $N_2O$. | Yes | In the summary tables, $N_2O$ emissions were reported in units of mass only. |
| Decision 17/CP.8, annex, paragraph 15 | Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of: | | |
| | (a) HFCs; | Yes | |
| | (b) PFCs; | Yes | Armenia reported PFC emissions as NO, NA, because they do not occur in the country. |
| | (c) $SF_6$. | Yes | Armenia reported $SF_6$ emissions as NA, NO, because they do not occur in the country. |
| 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 | |
| | (b) Nitrogen oxides; | Yes | |
| | (c) NMVOCs. | Yes | |
| Decision 17/CP.8, annex, paragraph 17 | Other gases not controlled by the Montreal Protocol, such as sulfur oxides, included in the Revised 1996 IPCC Guidelines may be included at the discretion of Parties. | Yes | Armenia reported on sulfur dioxide. |

| *Decision* | *Provision of the reporting guidelines* | *Yes/partly/ no/NA* | *Comments on the extent of the information provided* |
|---|---|---|---|
| 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. | NA | Armenia is a landlocked country. |
| 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 global warming potentials provided by the IPCC in its Second Assessment Report based on the effects of GHGs over a 100-year time-horizon. | Yes | |
| 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 | Armenia used the 2006 IPCC Guidelines and tier 2 and 3 methodologies were used for specific categories. |
| | (b) Explanation of the sources of EFs; | Yes | Armenia used the 2006 IPCC Guidelines as well as national methodologies for categories estimated using tier 2 and 3 methodologies. |
| | (c) Explanation of the sources of AD; | Yes | Armenia used the 2006 IPCC Guidelines. |
| | (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 | Armenia used country-specific methodologies for the estimation of sulfur dioxide emissions from metal mining (copper and ferromolybdenum). The calculation was based on the production technology and the chemical composition of the raw materials.<br>Armenia estimated NMVOC emissions from asphalt pavement and solvent use using EFs and methodologies for NMVOCs provided in the *EMEP/EEA air* |

| *Decision* | *Provision of the reporting guidelines* | *Yes/partly/ no/NA* | *Comments on the extent of the information provided* |
|---|---|---|---|
| | | | *pollutant emission inventory guidebook 2016*. Tier 1 methodologies were used for those specific categories. |
| | (i) Source and/or sink categories; | | |
| | (ii) Methodologies; | | |
| | (iii) EFs; | | |
| | (iv) AD; | | |
| | (e) Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building. | Yes | |
| Decision 17/CP.8, annex, paragraph 22 | Each non-Annex I Party is encouraged to use tables 1 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. | Yes | Notation keys were 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 | |
| | (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, paragraphs 3–10 and 41(g). Further, as per paragraph 3 of those guidelines, non-Annex I Parties are to submit updates of their national GHG inventories in accordance with 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. 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 2
**Identification of the extent to which the elements of information on mitigation actions are included in the second biennial update report of Armenia**

| *Decision* | *Provision of the reporting guidelines* | *Yes/partly/no* | *Comments on the extent of the information provided* |
|---|---|---|---|
| Decision 2/CP.17, annex III, paragraph 11 | Non-Annex I Parties should provide information, in tabular format, on actions to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol. | Yes | The Party provided two tables containing information on mitigation actions and their effects by sector. |
| Decision 2/CP.17, annex III, paragraph 12 | For each mitigation action or group of mitigation actions, including, as appropriate, those listed in document FCCC/AWGLCA/2011/INF.1, developing country Parties shall provide the following information, to the extent possible: | | |
| | (a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indicators; | Partly | Information on quantitative goals was not reported for some mitigation actions in the energy sector or any mitigation actions in the forestry sector (such as those on pages 54 and 63 of Armenia's second BUR). |
| | (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 | This information was not provided for the additional mitigation actions reported for the energy sector because the actual mechanisms of implementing these measures are not defined yet, there is currently no progress in implementation of these measures, and no actual steps are taken or envisaged. |
| | (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, paragraphs 11–13.

Table 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 second biennial update report of Armenia**

| *Decision* | *Provision of the reporting requirements* | *Yes/partly/no* | *Comments on the extent of the information provided* |
|---|---|---|---|
| Decision 2/CP.17, annex III, paragraph 14 | Non-Annex I Parties should provide updated information on: | | |
| | (a) Constraints and gaps; | Yes | |
| | (b) Related financial, technological and capacity-building needs. | Yes | |
| Decision 2/CP.17, annex III, paragraph 15 | Non-Annex I Parties should provide: | | |
| | (a) Information on financial resources received, technology transfer and capacity-building received; | Yes | |
| | (b) Information on technical support received from the Global Environment Facility, Parties included in Annex II to the Convention and other developed country Parties, the Green Climate Fund and multilateral institutions for activities relating to climate change, including for the preparation of the current BUR. | Yes | |
| Decision 2/CP.17, annex III, paragraph 16 | With regard to the development and transfer of technology, non-Annex I Parties should provide information on: | | |
| | (a) Nationally determined technology needs; | Partly | Armenia mentioned in its BUR that a technology needs assessment was conducted in 2014–2017, but no information on the results was reported in the BUR. |
| | (b) Technology support received. | Yes | |

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

# Annex II

## Documents and information used during the technical analysis

### Reference documents

"Composition, modalities and procedures of the team of technical experts for undertaking the technical analysis of biennial update reports from Parties not included in Annex I to the Convention". Annex to decision 20/CP.19. Available at https://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf.

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NC2 of Armenia. Available at https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-update-reports-non-annex-i-parties/national-communication-submissions-from-non-annex-i-parties.

Summary report on the technical analysis of the first BUR of Armenia. Available at http://unfccc.int/national_reports/non-annex_i_parties/ica/technical_analysis_of_burs/items/10054.php.

"UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention". Annex III to decision 2/CP.17. Available at http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf.