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Technical analysis of the third biennial update report of North Macedonia submitted on 3 June 2021

Summary report by the team of technical experts

Summary

According to decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention, consistently with their capabilities and the level of support provided for reporting, were to submit their first biennial update report by December 2014. Further, paragraph 41(f) of that decision states that Parties not included in Annex I to the Convention shall submit a biennial update report every two years, either as a summary of parts of their national communication in the year in which the national communication is submitted or as a stand-alone update report. As mandated, the least developed country Parties and small island developing States may submit biennial update reports at their discretion. This summary report presents the results of the technical analysis of the third biennial update report of North Macedonia, conducted by a team of technical experts in accordance with the modalities and procedures contained in the annex to decision 20/CP.19.

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AD	activity data
AFOLU	agriculture, forestry and other land use
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BUR	biennial update report
CH_4	methane
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
EF	emission factor
ETF	enhanced transparency framework under the Paris Agreement
EU	European Union
e-WAM	'with extended mitigation measures'
FAOSTAT	statistical database of the Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GHG	greenhouse gas
HFC	hydrofluorocarbon
HWP	harvested wood products
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
MOEPP	Ministry of Environment and Physical Planning of North Macedonia
MRV	measurement, reporting and verification
N_2O	nitrous oxide
NA	not applicable
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NIR	national inventory report
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
PFC	perfluorocarbon
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
SF_6	sulfur hexafluoride
TTE	team of technical experts
UNDP	United Nations Development Programme
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'

I. Introduction and process overview

A. Introduction

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

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

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

4. North Macedonia submitted its second BUR on 5 March 2018, which was analysed by a TTE in the eleventh round of technical analysis of BURs from non-Annex I Parties, conducted from 10 to 24 August 2018. After the publication of its summary report, North Macedonia participated in the seventh workshop for the facilitative sharing of views, convened in Bonn on 19 June 2019.

5. This summary report presents the results of the technical analysis of the third BUR of North Macedonia, 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, North Macedonia submitted its third BUR on 3 June 2021 as a stand-alone update report. The submission was made within three years and three months from the submission of the second BUR.

7. During the technical analysis, the Party explained the reasons for submitting the BUR more than two years after the submission of the last BUR. The Party clarified that the third BUR was finalized in August 2020 and submitted to MOEPP in November 2020. However, owing to parliamentary elections and the country's coronavirus disease 2019 restrictions, which reduced the availability of staff in the relevant institutions, the Government postponed its adoption of the third BUR until 2021.

8. A desk analysis of North Macedonia's BUR was conducted remotely from 29 November to 3 December 2021 and was undertaken by the following TTE, drawn from the UNFCCC roster of experts on the basis of the criteria defined in decision 20/CP.19, annex, paragraphs 2–6: Koffi Ayassou (Togo), Kamal Djemouai (former member of the Consultative Group of Experts from Algeria), Valentina Idrissova (Kazakhstan), Mwangi James Kinyanjui (Kenya), Inga Konstantinaviciute (Lithuania), William L'Heudé (France), Maria Jose Lopez (Belgium), Christopher Manda (Malawi), Neranda Maurice-George (Saint Lucia), Malik Mechhoud (Algeria), Noura Mohamed Lotfy (Egypt), Mame Coumba Ndiaye (Senegal) and Koen E.L. Smekens (Belgium). Mr. Kinyanjui and Ms. Lopez were the co-leads. The technical analysis was coordinated by Davor Vesligaj and Anna Sikharulidze (secretariat).

9. During the technical analysis, in addition to the written exchange, in the virtual team room, to provide technical clarifications on the information reported in the BUR, the TTE

and North Macedonia 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 North Macedonia's third BUR, the TTE prepared and shared a draft summary report with North Macedonia on 1 March 2022 for its review and comment. North Macedonia, in turn, provided its feedback on the draft summary report on 27 May 2022.

10. The TTE responded to and incorporated North Macedonia's comments referred to in paragraph 9 above and finalized the summary report in consultation with the Party on 22 June 2022.

II. Technical analysis of the biennial update report

A. Scope of the technical analysis

11. 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).

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

B. Extent of the information reported

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

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

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

[1] The consultation was conducted via videoconferencing.

C. Technical analysis of the information reported

16. The technical analysis referred to in paragraph 11(b) above aims to increase the transparency of information reported by the Parties on mitigation actions and their effects, without engaging in a discussion on the appropriateness of those actions. Accordingly, the focus of the technical analysis was on the transparency of the information reported in the BUR.

17. For information reported on national GHG inventories, the technical analysis also focused on the consistency of the methods used for preparing those inventories with the appropriate methods developed by the IPCC and referred to in the UNFCCC reporting guidelines on BURs.

18. The results of the technical analysis are presented in the remainder of this chapter.

1. Information on national circumstances and institutional arrangements relevant to the preparation of national communications on a continuous basis

19. As per the scope defined in paragraph 2 of the UNFCCC reporting guidelines on BURs, the BUR should provide an update to the information contained in the most recently submitted NC, including information on national circumstances and institutional arrangements relevant to the preparation of NCs on a continuous basis. In their NCs, non-Annex I Parties report on their national circumstances following the reporting guidance contained in decision 17/CP.8, annex, paragraphs 3–5, and they could report similar information in their BUR, which is an update of their most recently submitted NC.

20. In its third BUR, North Macedonia provided an update on its national circumstances, including information on its geographical, demographic and socioeconomic circumstances; sectoral GHG emission overviews for the energy, IPPU, AFOLU and waste sectors; and a description of its climate policy framework, including its current institutional framework. Although North Macedonia is a non-Annex I Party, it is an EU candidate country and thus adheres to EU climate and energy policies, thereby assuming the same commitments as Parties included in Annex I to the Convention.

21. North Macedonia transparently reported in its third BUR an update 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 legal status and roles and responsibilities of the overall coordinating entity, the involvement and roles of other institutions and experts, mechanisms for information and data exchange, quality assurance/quality control procedures, and provisions for public consultation and other forms of stakeholder engagement.

22. The legal framework for climate change currently falls under the Law on Environment, which also sets out the details for developing North Macedonia's national GHG inventories. As an EU candidate country, North Macedonia adopted a long-term climate action strategy in 2021 and is in the process of drafting a law on climate action that is expected to be adopted in 2022. The Party reported that it is developing a project proposal for its national climate change adaptation plan. When reviewing the draft technical analysis summary report, North Macedonia informed the TTE that a national energy and climate action plan, building on its national strategy for energy development until 2040, was adopted in 2022.

23. The information reported on institutional arrangements identifies MOEPP as the institution responsible for climate change policy and for leading the process of producing NCs and BURs, and as the national focal point to the UNFCCC. The National Climate Change Committee and the technical group of the National Council for Sustainable Development participate in the national inventory process and the production of NCs and BURs, along with other stakeholders such as stakeholders from the Government, civil society and international institutions, as well as donors. Within this framework, the Committee comprises stakeholders from the North Macedonian Government, academic institutions, the private sector and civil society, and it provides high-level support and guidance on climate change policy.

24. North Macedonia reported in its third BUR an update on its domestic MRV arrangements, which are being developed by MOEPP with the support of the GEF and UNDP through a Capacity-building Initiative for Transparency project. The description covers key aspects of the institutional arrangements, including legal obligations and their practical implications, approaches to monitoring used by the responsible institutions, channels for reporting, and verification of data. The MRV arrangements are designed at the national level and cover three main areas: the GHG inventory system, mitigation policies and measures and emission projections, and adaptation policies and measures. The system will build on the existing systems, processes and infrastructure, rendering it cost-effective. The Party reported that the implementation of the long-term climate action strategy and law on climate action will enable it to establish a national MRV system that complies with UNFCCC and EU requirements. North Macedonia reported that electronic systems are either under development or being tested, including software for automated data collection and software for addressing monitoring and reporting needs.

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

25. As indicated in table I.1, North Macedonia 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. North Macedonia submitted its third BUR in 2021 and the GHG inventory reported is for 1990–2016. The GHG inventory is not consistent with the requirements for the reporting time frame, as the latest reported inventory year is more than four years prior to the date of submission of the Party's third BUR. During the technical analysis, North Macedonia clarified that the adoption of the third BUR by the Government and its submission to the UNFCCC was postponed until 2021 and explained the reasons for this (see para. 7 above).

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

28. GHG emissions and removals for the BUR covering the 1990–2016 inventories were estimated using tier 1 and tier 2 methodologies from the 2006 IPCC Guidelines. The inventories were mainly estimated using the tier 1 methodology from the 2006 IPCC Guidelines, although tier 2 methodologies were applied for several categories in the energy sector (lignite, residual fuel oil and natural gas for fuel combustion activities), the IPPU sector (cement production in the mineral industry, and iron and steel production and ferroalloys production in the metal industry) and the waste sector (waste disposal at solid waste disposal sites). The TTE commends the Party for using the most recent guidelines.

29. Information on AD and EFs used and their sources, as well as on methodologies, was clearly reported in the BUR. Most of the AD were taken from official national sources (such as statistical yearbooks, energy balances, sectoral reports, the State Statistical Office database, and strategies and reports from relevant institutions) or international databases, such as United Nations projections on population and gross domestic product, and FAOSTAT.

30. Information on the Party's total GHG emissions by gas for 2016 is outlined in table 1 in Gg CO_2 eq. It shows a decrease in emissions of 34.3 per cent with land and HWP since 1990 (8,026.60 Gg CO_2 eq).

Table 1
Greenhouse gas emissions by gas of North Macedonia for 2016

Gas	*GHG emissions (Gg CO_2 eq) including land and HWP[a]*	*% change 1990–2016*	*GHG emissions (Gg CO_2 eq) excluding land and HWP[a]*	*% change 1990–2016*
CO_2	5 641.0	–43.5	7 731.1	–24.1
CH_4	1 588.3	–8.7	1 588.3	–8.7

[2] https://unfccc.int/documents/278545.

Gas	*GHG emissions (Gg CO_2 eq) including land and HWP[a]*	*% change 1990–2016*	*GHG emissions (Gg CO_2 eq) excluding land and HWP[a]*	*% change 1990–2016*
N_2O	475.6	3.1	475.6	3.1
HFCs	315.7	NA	315.7	NA
PFCs	NE	NA	NE	NA
SF_6	NE	NA	NE	NA
Other	NA	NA	NA	NA
Total	**8 020.6**	**–34.3**	**10 110.8**	**–35.0**

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

31. Information on other emissions was clearly reported, including 15.93 Gg nitrogen oxides, 47.54 Gg carbon monoxide, 17.38 Gg non-methane volatile organic compounds and 59.98 Gg sulfur oxides.

32. SF_6 emissions were not reported in North Macedonia's BUR. However, the Party provided relevant clarification in its BUR, stating that the lack of relevant AD prevented their estimation.

33. North Macedonia applied notation keys in tables where numerical data were not provided.

34. The use of notation keys was not fully consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties and the 2006 IPCC Guidelines. North Macedonia reported "NA" and "NO" instead of "NE" for several categories where emissions were not estimated owing to a lack of data, in particular the product use categories in the IPPU sector. During the technical analysis, North Macedonia clarified that notation keys were entered manually for many categories, and that it misinterpreted the appropriate use of notation keys. The Party informed the TTE of the correct notation keys during the technical analysis.

35. North Macedonia reported information at the aggregate level addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF and the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines.

36. Information on carbon stock changes was not reported in North Macedonia's BUR. During the technical analysis, the Party clarified that it used the IPCC inventory software reporting tables, which do not include the carbon pools, for inventory preparation.

37. The shares of emissions that different sectors contributed to the Party's total GHG emissions excluding land and HWP (category 3.B and 3.D), as reported by the Party, in 2016 are reflected in table 2.

Table 2
Shares of greenhouse gas emissions by sector of North Macedonia for 2016

Sector	*GHG emissions (Gg CO_2 eq)*	*% share[a]*	*% change 1990–2016*
Energy	7 449.3	73.7	–22.8
IPPU	858	8.5	–8.0
AFOLU	–2 087.8	NA	–147.2
Livestock (category 3.A)	833.5	8.2	–24.8
Land (category 3.B)	–3 281.1	NA	–211.4
Aggregate sources and non-CO_2 emissions sources on land (category 3.C)	359.8	3.6	–5.9
HWP and other emissions (category 3.D)	NE	NA	NA
Waste	610.2	6.0	50.0

[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)).

38. North Macedonia reported information on its use of global warming potential values consistent with those provided by the IPCC in its AR4 based on the effects over a 100-year time-horizon of GHGs.

39. For the energy sector, information was clearly reported on GHG emissions, methodological tier levels, AD and their sources and key categories. The decreasing emission trend is due to reduced electricity production in energy industries, which was mainly replaced by electricity imports. Most energy sector GHG emissions in 2016 were linked to the energy industries category (51.0 per cent), followed by transport (28.1 per cent) and manufacturing industries and construction (13.9 per cent). Some 2 per cent of energy sector emissions were fugitive emissions from lignite extraction, oil refining and natural gas transmission.

40. For the industrial processes and other product use sector, information was clearly reported on GHG emissions, methodological tier levels, AD and their sources and key categories for the industrial processes categories, but only the most significant categories (refrigeration and air conditioning) were reported for the product use subsector. During the technical analysis, the Party clarified that it had difficulty implementing systems for the continuous collection of data for specific data providers owing to the nature of BUR development, which was project-based, but noted that it plans to improve the completeness of its reporting on emissions from product use in future reporting.

41. The trend of emissions in the IPPU sector is marked by a slowdown in industrial production following a period of economic transition in the 1990s. Many industrial plants in the country have either reduced production or entirely shut down. However, cement production and the use of substitutes for ozone-depleting substances for refrigeration and air conditioning have continued, becoming the largest contributors of GHG emissions from the IPPU sector. The metal industry, which used to be the main contributor to the sector's GHG emissions, is now the third-highest emitting subsector, with emissions from the production of steel and ferroalloys predominating. Only a small portion of emissions comes from the chemical industry subsector, as there are no large chemical-producing plants in North Macedonia.

42. For categories 3.A and 3.C under the AFOLU sector from the 2006 IPCC Guidelines, agricultural soils (N_2O) and enteric fermentation (CH_4) were identified as key categories and the most relevant emissions sources in the sector.

43. AD for the agriculture sector (e.g. the number of livestock and the amount of fertilizer used) were not reported in the BUR. Instead, the Party provided in the NIR weblinks to the State Statistical Office for official data on livestock and to FAOSTAT and the International Fertilizer Association database for data on fertilizers, from where the AD can be retrieved.

44. For land and HWP (categories 3.B and 3.D), North Macedonia reported annual GHG emissions and removals for 1990–2016. Overall, net removals from land and HWP (categories 3.B and 3.D) fluctuated between a minimum of 509.78 CO_2 eq in 1990 and a maximum of 3,603.62 CO_2 eq in 2016.

45. For the waste sector, information was clearly reported on GHG emissions, methodological tier levels, AD and their sources and key categories. The solid waste disposal category was the highest contributor, accounting for 78 per cent of total GHG emissions from the waste sector in 2016, followed by wastewater treatment and discharge, representing 19 per cent of GHG emissions from the sector in 2016. Incineration and open burning of waste contributed some 4 per cent of total sector emissions in the last three reported years (2014–2016).

46. The BUR provides an update to all GHG inventories reported in the Party's second BUR, which addresses anthropogenic emissions and removals for 1990–2014. The update was carried out for 1990–2016 using the methodologies contained in the 2006 IPCC Guidelines, thus generating a consistent 27-year time series. The Party reported that it recalculated emissions mainly owing to improvements in the AD collected.

47. North Macedonia described in its BUR the institutional framework for the preparation of its 2016 GHG inventory. The Party reported that MOEPP is the governmental body responsible for its climate change policy and GHG inventory, which was prepared with the support of UNDP. MOEPP is responsible for supervising GHG inventory preparation, which

is carried out by the GHG inventory development team, whose members are from the Macedonian Academy of Sciences and Arts or are external sectoral experts. During the technical analysis, the Party outlined several measures aimed at ensuring that its national MRV system complies with UNFCCC and EU requirements, such as maintaining current inventory preparation practices and institutionalizing the GHG inventory preparation process, which is at the moment project-based.

48. North Macedonia clearly reported that a key category analysis was performed for the level of emissions for 1990 (base year) and 2016 (the latest reported year) and for the trend in emissions between 1990 and 2016. The level assessment identified the five categories with the highest absolute values in Gg CO_2 eq (including both emissions sources and removals): forest land remaining forest land; energy industries – solid fuels; solid waste disposal; road transportation; and manufacturing industries and construction – liquid fuels. The trend assessment for 2016 identified the five most significant key categories: solid waste disposal; road transportation; energy industries; other sectors – liquid fuels; and energy industries – liquid fuels.

49. The BUR provides information on quality assurance/quality control measures for all sectors. In the summary report on the technical analysis of the Party's second BUR, the previous TTE concluded that the Party reported all the elements of information on GHGs required under the UNFCCC reporting guidelines on BURs.[3] The NIR submitted in conjunction with the third BUR has been updated and improved compared with the previous NIR. The TTE commends North Macedonia for the information and level of detail provided in the NIR.

50. North Macedonia clearly reported information on CO_2 fuel combustion using both the sectoral and the reference approach. The Party reported in the NIR that the differences in energy consumption and CO_2 emission estimates between the sectoral and reference approaches are less than 2 per cent for all reported years, and the differences for 2014–2016 are less than 0.02 per cent.

51. Information was clearly reported on international aviation and marine bunker fuels. The Party reported 47.9 Gg CO_2 emissions from international aviation for 2016. Marine bunker fuels were reported as "NO".

52. North Macedonia reported information on the uncertainty assessment (level) of its national GHG inventory. The uncertainty analysis was based on tier 1 (error propagation) and tier 2 (Monte Carlo simulation) approaches, and a comparison was made between the approaches. Under the tier 2 analysis, the highest uncertainty was reported for the waste sector. This is primarily due to the large number of variables with high uncertainty, such as the total amount of municipal waste and the fraction of that amount sent to solid waste disposal sites, CH_4 correction factor and waste generation rate. Additionally, there is significant uncertainty associated with the livestock subcategory of the AFOLU sector. The TTE commends North Macedonia for implementing the tier 2 approach, and for providing in its BUR detailed information on the selected uncertainty values for AD and EFs.

53. Information was not reported in North Macedonia's BUR on the underlying assumptions for the uncertainty values for AD and EFs which are not default values provided by the IPCC inventory software or based on the 2006 IPCC Guidelines. During the technical analysis, the Party clarified that uncertainty analyses were carried out by the Macedonian Academy of Sciences and Arts, which has developed a detailed model using different software (MATLAB) to enable it to calculate uncertainty according to the Monte Carlo simulation approach. This software is directly linked to the IPCC inventory software database for North Macedonia. In most cases, the default IPCC values were used.

54. The TTE noted that the transparency of the information reported on GHG inventories could be further enhanced by addressing the areas noted in paragraphs 26, 34, 36 and 53 above, which could facilitate a better understanding of the information reported on GHG inventories.

[3] FCCC/SBI/ICA/2018/TASR.2/MKD, para. 47.

55. North Macedonia reported in its NIR (section 11) information on its areas for improvement for reporting its GHG inventory. During the technical analysis, the Party explained its current initiatives for enhancing its institutional arrangements, which include a law on climate action to ensure compliance with requirements under the ETF and expressed its willingness to participate in training on GHG inventory reporting according to the agreed common reporting table formats.

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

56. As indicated in table I.2, North Macedonia reported in its third 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.

57. The information reported provides a mostly clear and comprehensive overview of the Party's mitigation actions and their effects. In its third BUR, North Macedonia reported information on its national context and framed its national mitigation policies in the context of its NDC. North Macedonia was the twenty-third country to submit its NDC, following Government decision 42-17/91 (28 July 2015). In its NDC, the Party has committed to reduce the CO_2 emissions from fossil fuel combustion by 30 per cent, that is, by 36 per cent at a higher level of ambition, by 2030 compared to the 'business as usual' scenario. The country is currently updating its NDC.

58. North Macedonia reported that climate change has been mainstreamed in and integrated into its development plans, including mitigation, and in particular, its national strategy for energy development until 2040. Most of the mitigation actions are in the energy sector. North Macedonia reported that both direct and indirect linkages to the Sustainable Development Goals were relevant for its mitigation measures.

59. The Party provided in its BUR an economic analysis for 2020–2040 of the measures under three scenarios: the reference (WEM), moderate transition (WAM) and green (e-WAM) scenarios. Mitigation measures reported under the WAM scenario would require EUR 18.411 billion investment for implementation, of which some 99 per cent would be required by the energy sector. Mitigation measures under the e-WAM scenario would require EUR 21,348 million for implementation, with the same percentage allocated to the energy sector. Implementing mitigation measures under the WEM scenario would require EUR 13,308 million, of which some 99 per cent is anticipated for investment in the energy sector.

60. The Party reported a summary of its mitigation actions in tabular format in accordance with decision 2/CP.17, annex III, paragraph 11. The information on national context and projections and their results was presented in narrative and graphical format.

61. Consistently with decision 2/CP.17, annex III, paragraph 12(a), North Macedonia clearly reported the names of mitigation actions, coverage (sector and gases) and progress indicators in the BUR (annex 6). A clear description of mitigation actions, as well as information on emissions by source and removals by sink, was provided in the BUR.

62. Information on quantitative goals was not reported in North Macedonia's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that quantitative goals are presented to some extent for each measure under assumptions.

63. North Macedonia clearly reported in the BUR information on methodologies and assumptions, and the objectives of the actions. The progress of implementation of actions and underlying steps taken or envisaged to achieve them was reported for most actions.

64. The Party assessed the economic, environmental and social impacts of possible mitigation actions for 2017–2040 using the metrics specific cost (in EUR/t CO_2 eq), environmental effectiveness (in t CO_2 eq) and potential for domestic green job creation. The results are illustrated for 2030 as a marginal abatement cost curve (BUR figure 4-5), total GHG emission reductions (BUR figure 4-6) and specific costs (BUR figure 4-7). The specific costs for mitigation measures reported range from EUR –982/t CO_2 eq to EUR 270/t CO_2 eq (BUR figure 4-7). The results of the analysis give the number of potential green jobs created as 5,309 by 2030 for the WEM scenario, 7,035 by 2030 for the WAM scenario and 9,895 by

2035 for the e-WAM scenario, with at least 25 per cent of these green jobs held by women in 2035. Under all scenarios, most of these jobs emerge in the energy sector, focusing on energy efficiency, with retrofitting identified as the activity that accounts for the highest percentage (50 per cent) of jobs created (BUR figure 4-9). The TTE commends the Party for reporting this detailed and useful information.

65. The mitigation actions under the e-WAM scenario are expected to result in estimated emission reductions of 3,900 Gg CO_2 eq between 2012 and 2030, with the waste sector identified as the main source of emission reductions (BUR figure 1.7). For the WAM scenario, the estimated emission reduction for the proposed measures amounts to 5,600 Gg CO_2 eq (BUR figure 4-5).

66. In the energy industries subsector, the mitigation actions focus mainly on promoting renewable energy sources (solar, hydro, biomass) and reducing losses and were reported as ongoing or planned. The Party also reported regulatory and fiscal measures, such as a feed-in tariff and a CO_2 tax. The largest emission reduction in 2030 is expected to result from the measure on large hydropower plants: 740.7 Gg CO_2 eq under the WAM scenario.

67. Information on progress for measure A-47 (introduction of a CO_2 tax) was not reported in North Macedonia's BUR. During the technical analysis, the Party clarified that the CO_2 tax is related to all measures in the energy sector and is linked to their progress because introduction of the tax will increase the penetration of the measures.

68. In the residential, commercial and service subsector, the mitigation actions focus mainly on improving energy efficiency of equipment and retrofitting buildings and were reported as ongoing. The Party also reported regulatory measures, such as energy efficiency obligation schemes, labelling of appliances and green procurement practices. The largest emission reduction in 2030 is expected to result from the measure on increasing the use of heat pumps: 392.3 Gg CO_2 eq under the WAM scenario.

69. In the industry sector, the mitigation actions focus mainly on improving energy efficiency of equipment and improving energy management and were reported as ongoing. The largest emission reduction in 2030 is expected to result from the measure on introducing more advanced technologies: 128.3 Gg CO_2 eq under the WAM scenario.

70. In the transport subsector, the mitigation actions focus mainly on the renewal and electrification of the transport fleet and were reported as ongoing. The largest emission reduction in 2030 is expected to result from the measure on renewing the national road fleet: 64.6 Gg CO_2 eq under the WAM scenario.

71. In the AFOLU sector, the mitigation actions focus mainly on manure management, integrated forest fire management, afforestation and land management and were reported as ongoing or planned. The largest emission reduction in 2030 is expected to result from the measure on establishing integrated management of forest fires: 345.0 Gg CO_2 eq under the WAM scenario. Co-benefits related to its mitigation actions were reported, specifically biochar and contour cultivation measures.

72. In the waste sector, the mitigation actions focus mainly on landfill and waste management and were reported as ongoing or planned. The largest emission reduction in 2030 is expected to result from the measure on landfill gas flaring: 489.7 Gg CO_2 eq under the WAM scenario.

73. The steps taken were not reported in the BUR for six actions: A-51, increased use of heat pumps (p.261); A-59, phasing out of incandescent lights (p.273); A-73, reduction of N_2O emissions from manure management in dairy cows by 20 per cent (p.292); A-75, reduction of N_2O emissions from manure in dairy cows by 20 per cent for farms below 50 livestock units (p.294); A-79, use of biochar for carbon sinks on agricultural land (p.298); and A-86, improved waste and materials management at industrial facilities (p.306). During the technical analysis, the Party provided additional information on the steps taken in relation to measures A-51 and A-59 and clarified that all other measures are planned and it is therefore not possible to report the steps taken.

74. Information on expected results was reported by the Party; however, the results achieved for ongoing mitigation measures were not reported in North Macedonia's BUR and

the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that the results were not reported in the BUR because estimates for almost every measure are included in its fourth National Energy Efficiency Action Plan, which was adopted by the Government in September 2021 after the submission of the BUR.

75. North Macedonia did not provide information on its involvement in international market mechanisms as a Party to the Kyoto Protocol and the reason for this was not clear to the TTE. In its BUR the Party reported that its strategy for energy development until 2040 and its third BUR include a measure for introducing a CO_2 tax, which will be the first step in establishing a carbon market mechanism.

76. North Macedonia reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that North Macedonia is in the process of designing and developing a domestic MRV system for mitigation actions. North Macedonia reported that a variety of electronic systems for addressing monitoring and reporting needs are under development or being tested, including software for partially automating data collection for preparing the energy balance; a monitoring and verification web platform for monitoring the implementation of the National Energy Efficiency Action Plan; ExCITE, software for monitoring energy consumption in municipalities; a dedicated tool for monitoring the national energy market; software called Emission Monitoring in Industry; and the Vehicle Registry. Although national legislation clearly indicates that monitoring systems should be established, and several systems are under development or being tested, the responsible institutions still require comprehensive, fully operational systems. MOEPP is currently designing the National Environmental Information System, incorporating all existing information systems under its jurisdiction, including the climate change MRV platform anticipated to be developed under a Capacity-building Initiative for Transparency project.

77. Further, North Macedonia reported consistently with the voluntary general guidelines for domestic MRV of domestically supported nationally appropriate mitigation actions, contained in the annex to decision 21/CP.19. North Macedonia outlined in the BUR the measures considered by the Party for establishing an enhanced MRV system (pp.161–163).

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 62, 67, 73 and 74 above, which could facilitate a better understanding of the information reported on mitigation actions.

79. North Macedonia reported in its BUR (sections 5 and 7) information on its areas for improvement for future BURs and its current initiatives for enhancing its existing MRV system for compliance with requirements under the ETF. The initiatives relate to financial, technical and capacity-building needs. The Party's needs cover, inter alia, financial resources, capacity-building and technology transfer, such as nominating and selecting a national designated entity as a focal point for the technology transfer mechanism as soon as possible. The TTE commends the Party for the clear and comprehensive reporting on its proactive approach to preparing for ETF implementation.

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

80. As indicated in table I.3, North Macedonia 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.

81. North Macedonia clearly reported information on constraints and gaps, and related financial, technical and capacity-building needs in accordance with decision 2/CP.17, annex III, paragraph 14. In its BUR, North Macedonia identified constraints related to the capacity of institutional, regulatory, legislative and human resources and financial constraints. North Macedonia reported that its financial, technical and capacity-building needs are primarily in the area of optimizing the development of the reporting mechanisms at the institutional and national level. The Party identified technical and capacity-building needs, including the need to train government officials for conducting national GHG inventories and establish an expert technical group at the Macedonian Environmental Information Centre. Technical and

capacity-building needs related to financing mitigation actions include the need to design more accurate financial instruments.

82. North Macedonia reported information on financial resources, technology transfer and capacity-building in accordance with decision 2/CP.17, annex III, paragraph 15. In its BUR, North Macedonia reported that it received USD 25,145 million through bilateral and multilateral financial support in 2018–2019 and USD 846,796 million in 2015–2020. North Macedonia reported that most of its financial support in 2018–2019 originated from the EU, the GEF and UNDP. The information reported indicates that the Party received capacity-building and technical support from several bilateral and multilateral institutions. The Party reported that it received support from the GEF for preparing its third BUR (USD 324,550) and from UNDP for stakeholder inclusion, planning, data collection and modelling inputs. In its BUR, the Party reported that approximately one third of the financial support received in 2018–2019 was directed towards mitigation initiatives, 29 per cent towards adaptation initiatives, 27 per cent towards cross-cutting initiatives, and 11 per cent towards other initiatives. North Macedonia reported that most of the financial support received in 2018–2019 was in the general environmental protection sector, followed by the energy generation, distribution and efficiency sector.

83. 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, was not clearly reported in North Macedonia's BUR. During the technical analysis, the Party clarified that those needs include establishing a national designated entity to serve as a national focal point on technology transfer and providing information on financing through programmes on research, development and innovation initiatives related to climate change. The Party indicated that the national designated entity should pursue several actions, including joining the Climate Technology Centre and Network, communicating with the national designated authority and the Green Climate Fund, and fostering cooperation, partnership and networking among stakeholders.

84. Information on technology support received was not clearly reported in North Macedonia's BUR. During the technical analysis, the Party clarified that the level of technology support received in 2018–2019 was low. North Macedonia indicated that only one project (USD 460,000 in 2018–2019) relates to technology support, although it also includes technical and capacity-building support.

85. 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 83 and 84 above, which could facilitate a better understanding of the information reported on needs and support received.

5. Any other information

86. North Macedonia reported some information on education, gender inclusion, sustainable development and public awareness activities related to climate change under Article 6 of the Convention.

87. In its BUR, the Party reported it has developed an Action Plan on Gender and Climate Change with the support and guidance of the Global Support Programme for Preparation of National Communications and Biennial Update Reports by non-Annex I Parties and UNDP that outlines concrete steps to build institutional capacity relating to the integration of gender considerations into climate change at both the policy design and the policy implementation level. In 2019, UNDP and MOEPP conducted an online survey to assess public perception and awareness regarding climate change. According to the Party, when compared with previous surveys from 2014 and 2016, the results show greater public awareness of climate change mitigation and adaptation issues.

88. On education, North Macedonia conducted an assessment of the level of integration of climate change and sustainable development issues into its national education system. The Party also reported several initiatives undertaken to achieve the Sustainable Development Goals involving stakeholders from the North Macedonian Government, foreign governments, academia, international institutions and civil society, and indicated its commitment to provide

open, transparent, reliable and efficient government data to civil society through the Open Government Partnership.

D. Identification of capacity-building needs

89. In consultation with North Macedonia, the TTE did not identify needs for capacity-building that could facilitate the preparation of subsequent BURs and participation in ICA. However, in consultation with North Macedonia, the TTE identified a capacity-building need for transitioning to the ETF, namely, enhancing capacity for using CRT Reporter to prepare for reporting with the new GHG inventory common reporting tables.

90. The TTE noted that North Macedonia reported the following capacity-building needs in BUR section 5.2, which include capacity-building needs for future BURs:

(a) Strengthening national capacity to conduct and prepare the GHG inventory;

(b) Strengthening institutional and human capacity by establishing climate change units or climate focal points to develop and operationalize the MRV arrangements;

(c) Enhancing national capacity to design mechanisms for financing mitigation actions.

III. Conclusions

91. The TTE conducted a technical analysis of the information reported in the third BUR of North Macedonia in accordance with the UNFCCC reporting guidelines on BURs and concludes that the information reported is mostly consistent. It provides an overview of national circumstances and institutional arrangements relevant to the preparation of NCs on a continuous basis; the national inventory of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol, including an NIR; mitigation actions and their effects, including associated methodologies and assumptions; constraints and gaps, and related financial, technical and capacity-building needs, including a description of support needed and received; the level of support received to enable the preparation and submission of BURs; domestic MRV and its planned and ongoing improvements; and any other information relevant to the achievement of the objective of the Convention. During the technical analysis, additional information was provided by North Macedonia on the GHG inventory, steps taken and quantitative goals for some of the mitigation measures, and nationally determined technology needs and technology support received. The TTE concluded that the information analysed is mostly transparent.

92. North Macedonia reported an update on the institutional arrangements relevant to the preparation of its BURs. MOEPP is responsible for supervising the national inventory process, the preparation of NCs and BURs, and reporting emissions to the UNFCCC. The National Climate Change Committee and the technical group at the National Council for Sustainable Development participate in these processes. The Party also reported that, as an EU candidate country, it adopted a long-term climate action strategy in 2021 and is in the process of drafting a law on climate action that is expected to be adopted in 2022. The Party has taken significant steps to establish institutional arrangements that enable sustainable preparation of its BURs, such as making organizational improvements and establishing knowledge-sharing procedures to facilitate sectoral information transfer.

93. In third BUR, submitted in 2021, North Macedonia reported information on its national GHG inventory for 1990–2016. This included GHG emissions and removals of CO_2, CH_4, N_2O, HFCs and PFCs for all relevant sources and sinks as well as the precursor gases. The inventory was developed on the basis of the 2006 IPCC Guidelines, and specific EF values and methodologies from the 2006 IPCC Guidelines were applied for individual key categories. The total GHG emissions for 2016 were reported as 10,110.8 Gg CO_2 eq (excluding land and HWP) and 8,020.6 Gg CO_2 eq (including land and HWP). Key categories were identified in order to make the most efficient use of available resources and prioritize efforts to improve the overall estimates. Estimates of some categories in the product use subsector were not provided owing to difficulties in obtaining the necessary data, a particular

difficulty being the project-based nature of GHG inventory compilation, which does not allow for the implementation of specific surveys and data-collection systems, as clarified by the Party during the technical analysis.

94. North Macedonia reported information on mitigation actions and their effects in tabular format, whereas information on national context and projections and their results was presented in both narrative and graphical format. The information included emission reduction targets and the baseline and mitigation scenarios for 2015–2040. North Macedonia framed its national mitigation planning and actions in the context of its national strategy for energy development until 2040. North Macedonia reported planned and ongoing actions in the energy, AFOLU and waste sectors. The mitigation actions focus on improving energy efficiency, promoting renewable energy, encouraging energy conservation, implementing a regulatory framework, improving building efficiency, improving agricultural and farming practices, and better managing forests.

95. The Party reported the progress of implementation of its mitigation actions and the results achieved for most actions, including estimated emission reductions. The highest estimated emission reduction was reported for the large hydropower plants action in the energy sector under the WAM scenario of 740.7 Gg CO_2 eq. North Macedonia reported that both direct and indirect linkages to the Sustainable Development Goals were relevant for its mitigation measures. The Party also reported information on its involvement in international market mechanisms and MRV arrangements.

96. North Macedonia reported information on key constraints, gaps and related needs in terms of institutional, regulatory, legislative and human resources capacity and financial constraints. The Party also reported that its financial, technical and capacity-building needs are primarily in the area of optimizing the development of the reporting mechanisms. Information was reported on the technical, technology transfer and capacity-building support received from bilateral and multilateral institutions in 2018–2019. The Party further reported that it received financial support in the amount of USD 25,145 million over this period, notably from the EU, the GEF and UNDP. North Macedonia reported that it also received support from the GEF and UNDP for preparing its latest BUR.

97. The current TTE noted improvements in the reporting in North Macedonia's third BUR compared with that in its previous BUR. The information reported demonstrates that the Party has taken into consideration the areas for enhancing the transparency of the information reported noted by the TTE in the summary report on the technical analysis of the second BUR. However, improvements are ongoing and the Party has taken note of outstanding areas for future improvements.

98. North Macedonia, in consultation with the TTE, identified one need for capacity-building to facilitate transition to the ETF listed in paragraph 89 above. North Macedonia prioritized all the capacity-building needs referred to in paragraph 90 above.

Annex I

Extent of the information reported by North Macedonia in its third biennial update report

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

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, paragraph 41(g)	The first BUR shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available, and subsequent BURs shall cover a calendar year that does not precede the submission date by more than four years.	No	North Macedonia submitted its third BUR in June 2021; the GHG inventories reported are for 1990–2016.
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	North Macedonia used the 2006 IPCC Guidelines.
Decision 2/CP.17, annex III, paragraph 5	The updates of the section on national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol should contain updated data on activity levels based on the best information available using the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF; any change to the EF may be made in the subsequent full NC.	Yes	
Decision 2/CP.17, annex III, paragraph 6	Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the BUR:		
	(a) The tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF;	Partly	Comparable information was not reported as carbon stock changes were not included.
	(b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines.	Yes	Comparable information was reported (a table by sector with emissions in CO_2 eq and by category and gas in the sectoral chapters of the Party's third BUR and in appendix II to the NIR).
Decision 2/CP.17, annex III, paragraph 7	Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in its previous NCs.	Yes	The Party reported a consistent time series for GHG emissions back to 1990 using the 2006 IPCC Guidelines.
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	
	The inventory section of the BUR should consist of an NIR as a summary or as an update of the	Yes	

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 9	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 the NIR (appendix II, tables 88–93).
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6).	Yes	Comparable information was reported in the NIR (table 15 and appendix II).
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex.	Yes	Sector-specific information was reported in the NIR.
Decision 17/CP.8, annex, paragraph 12	Non-Annex I Parties are also encouraged, to the extent possible, to undertake any key source analysis as indicated in the IPCC good practice guidance to assist in developing inventories that better reflect their national circumstances.	Yes	
Decision 17/CP.8, annex, paragraph 13	Non-Annex I Parties are encouraged to describe procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories, as well as efforts to make this a continuous process, including information on the role of the institutions involved.	Yes	
Decision 17/CP.8, annex, paragraph 14	Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of:		
	(a) CO_2;	Partly	CO_2 emissions for categories 2.D.1 (lubricant use) and 2.D.2 (paraffin wax use) are reported as "NO" owing to lack of data while they should be reported as "NE".
	(b) CH_4;	Yes	
	(c) N_2O.	Partly	N_2O use in anaesthesia is reported as "NO" in the country owing to lack of data while it should be reported as "NE".
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:		
	(a) HFCs;	Yes	
	(b) PFCs;	Yes	
	(c) SF_6.	No	The Party indicated that the data are not available to estimate SF_6 emissions, which is the only GHG that was not estimated. However, SF_6 emissions are reported as 0 instead of "NE" (NIR table 3 and figures).

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 17/CP.8, annex, paragraph 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emissions by sources of other GHGs, such as:		
	(a) Carbon monoxide;	Yes	
	(b) nitrogen oxides;	Yes	
	(c) non-methane volatile organic compounds.	Yes	
Decision 17/CP.8, annex, paragraph 17	Other gases not controlled by the Montreal Protocol, such as sulfur oxides, and included in the Revised 1996 IPCC Guidelines may be included at the discretion of Parties.	Yes	The Party reported on other gases, such as sulfur oxides.
Decision 17/CP.8, annex, paragraph 18	Non-Annex I Parties are encouraged, to the extent possible, and if disaggregated data are available, to estimate and report CO_2 fuel combustion emissions using both the sectoral and the reference approach and to explain any large differences between the two approaches.	Yes	
Decision 17/CP.8, annex, paragraph 19	Non-Annex I Parties should, to the extent possible, and if disaggregated data are available, report emissions from international aviation and marine bunker fuels separately in their inventories:		
	(a) International aviation;	Yes	
	(b) Marine bunker fuels.	Yes	The Party has reported marine bunker fuels as “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 global warming potential provided by the IPCC in its AR2 based on the effects of GHGs over a 100-year time-horizon.	NA	The Party used the global warming potential provided in the AR4.
Decision 17/CP.8, annex, paragraph 21	Non-Annex I Parties are encouraged to provide information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol, including a brief explanation of the sources of EFs and AD. If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe the source and/or sink categories, methodologies, EFs and AD used in their estimation of emissions, as 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	Emissions were estimated using tier 1 and tier 2 methodologies from the 2006 IPCC Guidelines.
	(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	NA	

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
	Revised 1996 IPCC Guidelines, they should explicitly describe:		
	(i) Source and/or sink categories;		
	(ii) Methodologies;		
	(iii) EFs;		
	(iv) AD;		
	(e) Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building.	Yes	
Decision 17/CP.8, annex, paragraph 22	Each non-Annex I Party is encouraged to use tables 1–2 of the guidelines annexed to decision 17/CP.8 in reporting its national GHG inventory, taking into account the provisions established in paragraphs 14–17. In preparing those tables, Parties should strive to present information that is as complete as possible. Where numerical data are not provided, Parties should use the notation keys as indicated.	Yes	
Decision 17/CP.8, annex, paragraph 24	Non-Annex I Parties are encouraged to provide information on the level of uncertainty associated with inventory data and their underlying assumptions, and to describe the methodologies used, if any, for estimating these uncertainties:		
	(a) Level of uncertainty associated with inventory data;	Yes	
	(b) Underlying assumptions;	Partly	The Party used default uncertainty values provided by the IPCC inventory software for AD and EFs but there is no information about underlying assumptions for the input values that are not default.
	(c) Methodologies used, if any, for estimating these uncertainties.	Yes	

Note: The parts of the UNFCCC reporting guidelines on BURs on reporting information on GHG emissions by sources and removals by sinks in BURs are contained in decision 2/CP.17, paras. 3–10 and 41(g). Further, as per para. 3 of those guidelines, non-Annex I Parties are to submit updates of their national GHG inventories in accordance with paras. 8–24 of the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties, contained in the annex to decision 17/CP.8. The scope of such updates should be consistent with the non-Annex I Party's capacity and time constraints and the availability of its data, as well as the level of support provided by developed country Parties for biennial update reporting.

Table I.2

Identification of the extent to which the elements of information on mitigation actions are included in the third biennial update report of North Macedonia

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

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 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	The Party did not present any quantitative goals in annex 6 to the BUR for mitigation actions from tables A-40 to A-86.
	(b) Information on:		
	(i) Methodologies;	Yes	
	(ii) Assumptions;	Yes	
	(c) Information on:		
	(i) Objectives of the action;	Yes	
	(ii) Steps taken or envisaged to achieve that action;	Partly	The Party presented steps envisaged for all 46 of its measures but did not present steps taken for six measures, specifically those presented in tables A-51, A-59, A-73, A-75, A-79 and A-86. The Party provided further information regarding the measures presented in tables A-51 and A-73 and clarified that the measures presented in tables A-75 through A-79 are planned measures.
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Partly	The Party did not present progress for the measure in table A-47 and explained that the exact contribution of this measure cannot be calculated, as its implementation requires the implementation of other measures (such as those related to renewable energy sources, energy efficiency and fuel switching) that are needed to replace the CO_2 emitters. The Party also clarified that fuel switching is planned for the industry and transport sectors.
	(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;	Partly	The Party reported on expected, rather than achieved, emission reductions for most of the mitigation actions.
	(e) Information on international market mechanisms.	Yes	

Decision	*Provision of the reporting guidelines*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 13	Parties should provide information on domestic MRV arrangements.	Yes	

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

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

Decision	*Provision of the reporting requirements*	*Assessment of whether the information was reported*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on:		
	(a) Constraints and gaps;	Yes	
	(b) Related financial, technical and capacity-building needs.	Yes	
Decision 2/CP.17, annex III, paragraph 15	Non-Annex I Parties should provide:		
	(a) Information on financial resources 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	Information on the legal framework and key policy instruments related to technology and research and development was reported in the BUR (section 5.3) but technology needs were not reported by the Party.
	(b) Technology support received.	Partly	BUR table 5-9 includes a column for “Technology support”, but all cells in this column are empty.

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/.

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

B. UNFCCC documents

Second and third BURs of North Macedonia. Available at https://unfccc.int/BURs.

NC1, NC2 and NC3 of North Macedonia. Available at https://unfccc.int/non-annex-I-NCs.

Summary reports on the technical analysis of the first and second BURs of North Macedonia, contained in documents FCCC/SBI/ICA/2015/TASR.1/MDK and FCCC/SBI/ICA/2018/TASR.2/MDK, respectively. Available at https://unfccc.int/ICA-reports.

C. Other documents

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

V Gecevska. 2020. *Current status of the research, development, innovation and technology transfer related to climate change in the Republic of North Macedonia: Rapid Assessment Report*. Available at https://klimatskipromeni.mk/data/rest/file/download/576bfeef7734bc62350b215b03e6a07c05b014b8d790ebd269b1527b0cfdf73b.pdf.