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Technical analysis of the second biennial update report of the Republic of Moldova submitted on 19 April 2019

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 review 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 reviews at their discretion. This summary report presents the results of the technical analysis of the second biennial update review of the Republic of Moldova, 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

AD	activity data
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BUR	biennial update report
CCO	Climate Change Office
CDM	clean development mechanism
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
EF	emission factor
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
ICA	international consultation and analysis
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPCC good practice guidance for LULUCF	*Good Practice Guidance for Land Use, Land-Use Change and Forestry*
LEDS	low-emission development strategy
LULUCF	land use, land-use change and forestry
MARDE	Ministry of Agriculture, Regional Development and Environment
MRV	measurement, reporting and verification
NA	not applicable
NAMA	nationally appropriate mitigation action
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NIR	national inventory report
NIS	report on the national greenhouse gas inventory system
NMVOC	non-methane volatile organic compound
NO	not occurring
non-Annex I Parties	Parties not included in Annex I to the Convention
NO_X	nitrogen oxides
NSMR	National System for Monitoring and Reporting Greenhouse Gas Emissions and Other Information Relevant to Climate Change
N_2O	nitrous oxide
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
SF_6	sulfur hexafluoride
SO_2	sulfur dioxide
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'
2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*

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 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. The Republic of Moldova submitted its first BUR on 5 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, the Republic of Moldova participated in the third workshop for the facilitative sharing of views, convened in Bonn on 15 May 2017.

5. This summary report presents the results of the technical analysis of the second BUR of the Republic of Moldova, 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, the Republic of Moldova submitted its second BUR on 27 December 2018 as a standalone report. The submission was made within two years after the submission of the first BUR. However, on 19 April 2019, the Party resubmitted its second BUR.

7. The technical analysis of the BUR took place from 27 to 31 May 2019 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: Sorin Deaconu (Romania), Sangay Dorji (Bhutan), Takeshi Enoki (Japan), Sandra Boitumelo Motshwanedi (South Africa), Stanford Mwakasonda (United Republic of Tanzania), Sekai Ngarize (Zimbabwe), Helen Joan Plume (New Zealand), Atsushi Sato (Japan), Ioannis Sempos (Greece), Samir Tantawi (Egypt) and Hartley Walimwipi (Zambia). Ms. Ngarize and Mr. Sempos were the co-leads. The technical analysis was coordinated by Alma Jean and Dirk Nemitz (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 the Republic of Moldova 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 the Republic of Moldova's second BUR, the TTE prepared and shared a draft summary report with the Republic of Moldova on 25 July 2019 for its review and comment. The Republic of Moldova, in turn, provided its feedback on the draft summary report on 25 August 2019.

[1] The consultation was conducted via teleconferencing.

9. The TTE responded to and incorporated the Republic of Moldova's comments referred to in paragraph 8 above and finalized the summary report in consultation with the Party on 17 September 2019.

II. Technical analysis of the biennial update report

A. Scope of the technical analysis

10. The scope of the technical analysis is outlined in decision 20/CP.19, annex, paragraph 15, according to which the technical analysis aims to, without engaging in a discussion on the appropriateness of the actions, increase the transparency of mitigation actions and their effects and shall entail the following:

(a) The identification of the extent to which the elements of information listed in paragraph 3(a) of the ICA modalities and guidelines (decision 2/CP.17, annex IV) have been included in the BUR of the Party concerned (see chap. II.B below);

(b) A technical analysis of the information reported in the BUR, specified in the UNFCCC reporting guidelines on BURs (decision 2/CP.17, annex III), and any additional technical information provided by the Party concerned (see chap. II.C below);

(c) The identification, in consultation with the Party concerned, of capacity-building needs related to the facilitation of reporting in accordance with the UNFCCC reporting guidelines on BURs and to participation in ICA in accordance with the ICA modalities and guidelines, taking into account Article 4, paragraph 3, of the Convention (see chap. II.D below).

11. The remainder of this chapter presents the results of each of the three parts of the technical analysis of the Republic of Moldova'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 fully 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 current TTE noted improvements in reporting in the Party's second BUR compared with that in the first BUR. Information on GHG inventories, mitigation actions and their effects and needs and support reported in the second BUR 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.

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 BUR, which is an update of their most recently submitted NC.

19. In its second BUR, the Republic of Moldova provided an update on its national circumstances and a description of the national and regional development priorities of the National Development Strategy of the Republic of Moldova (Moldova 2020) (Law No. 166/2012). The information reported under national circumstances includes features of geography, climate and economy that might affect the ability to deal with mitigating and adapting to climate change, and information regarding national circumstances and constraints on the specific needs and concerns arising from the adverse effects of climate change and/or the impact of the implementation of response measures, as referred to in Article 4, paragraph 8, and, as appropriate, in Article 4, paragraphs 9 and 10, of the Convention.

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

21. The Republic of Moldova reported detailed and transparent information on the institutional arrangements relevant for the preparation of its NCs, BURs and NIRs (see figure 1-1 in the BUR), including legal status, institutional arrangements, roles and responsibilities of the coordinating and collaborating agencies. MARDE is the state authority vested with the responsibility to develop and promote policies and strategies addressing various areas, including climate change, and is also responsible for implementing international environment treaties to which the Party is a signatory. The National Commission for Implementing Provisions of the United Nations Framework Convention on Climate Change and Provisions and Mechanisms of the Kyoto Protocol (hereinafter referred to as the National Commission) is the supreme authority responsible for implementing provisions and mechanisms of the Convention and its Kyoto Protocol, and it collaborates with an interministerial steering committee to execute its tasks.

22. The Climate Change Office was established in 2004 within the former Ministry of Environment and is now part of MARDE. The secretary of the National Commission is the manager of the Climate Change Office and is responsible for coordinating and monitoring the activities resulting from, and the implementation of, decisions of the National Commission. The main tasks of the Climate Change Office are supporting the government, central and local public administration authorities, and non-governmental and academic institutions in activities that are implemented and promoted under the Convention and its Kyoto Protocol, and implementing the associated climate change related programmes, projects and activities. During the period 2004–2018, the Climate Change Office had sole responsibility for activities related to the preparation of NCs, BURs and NIRs. It consisted of three teams: (1) the National GHG Inventory Team, (2) the Climate Change Mitigation Assessment, Monitoring, Reporting and Verification System Team and (3) the Climate Change Modelling, Vulnerability and Adaptation Assessment Team. Since 2018, the newly created Environment Agency has been responsible for areas related to climate change, including providing technical support to MARDE in preparing NCs and BURs. During the technical analysis, the Party informed the TTE that the NSMR had been established (through Government Decision No. 1277 of 26 December 2018; in force since 8 February 2019) and that the Environment Agency is now the competent authority responsible for implementing the NSMR.

23. The Party reported information on its existing and planned domestic MRV systems, which include the mechanisms established for national reporting on current and projected emissions, energy efficiency and activities related to the promotion of renewable energy under the Convention, as well as on CDM projects under the Kyoto Protocol.

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

24. As indicated in table 1 in annex I, the Republic of Moldova reported information on its GHG inventory in its BUR fully in accordance with paragraphs 3–10 of the UNFCCC reporting guidelines on BURs and paragraphs 8–24 of the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties, contained in the annex to decision 17/CP.8.

25. The GHG inventory reported by the Republic of Moldova covers the period 1990−2016, which is consistent with the requirements for the reporting time frame. The TTE commends the Republic of Moldova for preparing a 2016 GHG inventory and for enhancing the transparency of the information reported by including in the inventory years fewer than four years prior to the year of submission.

26. The Republic of Moldova submitted an NIR and an NIS in conjunction with its second BUR. The TTE commends the Party for this accomplishment and the comprehensive reporting in all three reports. The relevant chapters of the NIR were in most cases referenced in the BUR, and the documents were also made publicly available on the UNFCCC website.[2]

27. GHG emissions and removals for the BUR covering the 1990–2016 inventories were estimated using methods from the 2006 IPCC Guidelines and the *EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016* (EMEP/EEA, 2016); the latter was also used to estimate NO_X, CO, NMVOC and SO_2 emissions.

28. With regard to the methodologies used, information was clearly reported, including sources of AD and EFs, tier levels and areas for future inventory quality improvement. The BUR provided a summarized version of the more detailed NIR and NIS.

29. Information on the Party's total GHG emissions by gas for 2016 is outlined in table 1 below in Gg CO_2 eq. It shows a decrease in emissions (without LULUCF) of 67.5 per cent since 1990 (30.3 Gg CO_2 eq). Information on HFCs, PFCs and SF_6 and the use of notation keys was reported.

Table 1
Greenhouse gas emissions by gas of the Republic of Moldova for 2016

Gas	*GHG emissions (Gg CO_2 eq) including LULUCF*	*% change 1990–2016*	*GHG emissions (Gg CO_2 eq) excluding LULUCF*	*% change 1990–2016*
CO_2	8 545.8	–75.7	9 645.5	–73.8
CH_4	2 835.5	–44.1	2 835.1	–44.1
N_2O	2 099.7	–33.3	1 920.5	–35.5
HFCs	175.6	–	175.6	–
PFCs	0.04	–	0.04	–
SF_6	1.1	–	1.1	–
Other	–	–	–	–
Total	**13 657.8**	**–68.5**	**14 577.8**	**–67.5**

30. Other emissions reported include 24.0 Gg NO_X, 89.6 Gg CO, 52.9 Gg NMVOCs and 12 Gg SO_2 in 2016.

31. The Republic of Moldova applied notation keys in tables where numerical data were not provided. The use of notation keys was not consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties in some cases (see paras. 36 and 39 below).

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

32. The Republic of Moldova reported comparable information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF and the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines.

33. The shares of emissions that different sectors contributed to the total GHG emissions excluding LULUCF as reported by the Party in 2016 are reflected in table 2 below.

Table 2
Shares of greenhouse gas emissions by sector of the Republic of Moldova in 1990–2016

Sector	*GHG emissions (Gg CO_2 eq)*	*Share[a] (%)*	*Change (%) 1990–2016*
Energy	9 927.2	68.1	–72.9
IPPU	761.9	5.2	–51.9
Agriculture	2 428.5	16.7	–53.5
LULUCF	–920.0	NA	–39.8
Waste	1 460.3	10.0	–3.6

[a] Share of total without LULUCF.

34. While the UNFCCC reporting guidelines on BURs mandate the use of the GWP values from the AR2, the Republic of Moldova reported information on its use of GWP values consistent with those provided in the AR4, based on the effects over a 100-year time-horizon of GHGs. During the technical analysis, the Party clarified that in its first NDC, it stated its intention to use 100-year GWP values from the AR4 to calculate CO_2 eq totals. Further, the Party indicated that it would consider future updates to GWP values from ARs to report emission totals.

35. For the energy sector, in 2016, energy consumption decreased to only 26.5 per cent of the 1990 level; the reduction is attributable to an economic decline. GHG emissions decreased from 36.6 Mt CO_2 eq in 1990 to 9.6 Mt CO_2 eq in 2016 (a 72.9 per cent reduction). The share of energy sector emissions of the national total varied over the time series from 81.5 per cent in 1990 to 68.1 per cent in 2016. Information was clearly reported on the types of fuel used in the country. The main source of AD for estimating GHG emissions was the National Bureau of Statistics. Energy sector emissions were estimated using a tier 1 approach for all source categories except international bunkers and aviation, for which a tier 2 methodology was used. The TTE noted the Party's effort to use higher tier levels and country-specific factors for emission estimations from the combustion of some fuels. For example, for natural gas, country-specific annual average net caloric values were used, and for emissions from category 1.A.3b (road transportation) during the current reporting cycle, a tier 3 approach was tested for the 2014–2016 time series. The TTE commends the Republic of Moldova for such efforts.

36. The IPPU sector accounted for approximately 5.2 per cent of the total national GHG emissions in 2016, an increase from 3.5 per cent in 1990. During this period, the total IPPU emissions decreased from 1.6 Mt CO_2 eq in 1990 to 0.8 Mt CO_2 eq in 2016 (51.5 per cent). The Party reported that fluctuations in IPPU emissions between 2008 and 2016 were caused by various factors, including: the 2009 economic crisis; the after-crisis increase in cement, lime, glass and steel production; and an increase in the use of halocarbons. A tier 1 approach and default EF values, as well as a tier 2 approach and country-specific EFs, were used. The Republic of Moldova clearly documented all sources of information used in the estimations in the NIR. For example, data on clinker, lime, glass, ceramic and steel production were reported from the Republic of Moldova's statistical yearbooks, while data on soda ash imports were obtained from the Customs Service of the Republic of Moldova. In chapter 2.4.5 of the BUR, the Republic of Moldova reported the absence of estimations for emissions of HFCs from source categories 2.F.3 (fire protection), 2.F.5 (solvents) and 2.F.6 (other applications) owing to the absence of AD, with the corresponding use of the notation key "NO" for reporting these emissions in annex 6-2 to the BUR. In addition, in annex 6-6 for the categories 2.C (metal industry) and 2.D (non-energy products from fuels and solvent use), CO_2 was reported but CH_4 and N_2O were reported as "NO". During the technical analysis,

the Party clarified that it did not report these emissions because of the lack of EFs and methodologies to estimate emissions sources and that the use of notation keys would be reviewed to ensure the use of appropriate keys, including "NE" and "NA" rather than "NO", where appropriate. The TTE noted that including this revised information on notation keys in the BUR could facilitate a better understanding of the information reported.

37. For the agriculture sector, CH_4 from enteric fermentation and manure management, direct N_2O from manure management and agricultural soils, and indirect N_2O from manure management from agricultural soils were identified as key categories and the most relevant emissions sources in the sector. The Republic of Moldova used a combination of default EFs from the 2006 IPCC Guidelines and country-specific EFs to estimate the emissions from agriculture. Total GHG emissions from the agriculture sector decreased from 5.22 Mt CO_2 eq in 1990 to 2.43 Mt CO_2 eq in 2016 (a 53.5 per cent reduction), driven by the number of domestic livestock and poultry, the amount of synthetic and organic nitrogen fertilizers applied to soils, the quantities of agricultural crop residues returned to soils, and carbon losses from land-use change and soil management practices. The Republic of Moldova clearly documented all sources of information used in the estimations in the NIR. Data on the weight of the most prevalent breeds of livestock and poultry (table 5-10 of the NIR) fluctuate annually. Statistical annual and scientific reports were cited as sources for this table; however, the TTE was unclear on how the Party ensures the time-series consistency of data when multiple sources are cited for one data set. During the technical analysis, the Party clarified how it accounts for the fluctuation of data used in the estimations. The TTE noted that the Party clarifying the approach to ensuring the time-series consistency of data in the BUR could facilitate a better understanding of the information reported.

38. For the LULUCF sector, the Republic of Moldova reported GHG emissions and removals for the entire time series. The net removals from the LULUCF sector fluctuated between a maximum of 2.55 Mt CO_2 eq in 1991 and a minimum of 0.66 Mt CO_2 eq in 2014. There was an overall 39.8 per cent reduction in the time series, from 1.53 Mt CO_2 eq in 1990 to 0.92 Mt CO_2 eq in 2016. Recalculations were performed for several categories in the LULUCF sector for the second BUR, mostly as a result of updated AD becoming available. During the technical analysis, the Party informed the TTE that it had standardized the land conversion assumptions, causing changes in all lands converted for the entire time series, and for land remaining in the same land-use category since 1990. The Party also informed the TTE that an external expert had been consulted to verify the change in approach. The TTE commends the Republic of Moldova for its efforts to make technical improvements to the GHG inventory. The TTE noted that the Party reporting information on recalculations in the land-use change matrix (i.e. the changes and the rationale for the recalculations) could facilitate a better understanding of the information reported.

39. In 2016, the waste sector accounted for 10.0 per cent of the total national direct GHG emissions, an increase from 3.4 per cent in 1990. Emissions from this sector decreased by 3.6 per cent, from 1.52 Mt CO_2 eq in 1990 to 1.46 Mt CO_2 eq in 2016. The reduction in emissions from the waste sector is attributable to the economic decline that occurred in the Republic of Moldova. Emissions from the waste sector include CH_4 from solid waste disposal sites, and N_2O and CH_4 from wastewater handling and discharge. CO_2 emissions from incineration and the open burning of waste are the key categories. For emissions from solid waste disposal, incineration, open burning of waste, and wastewater treatment and discharge categories, tier 1 and tier 3 approaches were used. A number of specific data sources were mentioned, for example, AD on CH_4 recovered and combusted at a disposal site were obtained from a CDM project design document.[3] Default EF values from the 2006 IPCC Guidelines, as well as country-specific EFs, were used. Information was not reported for CH_4 and N_2O from category 5.B (biological treatment of solid waste); these emissions were reported as "NO, NE". During the technical analysis, the Republic of Moldova clarified that, in some cases, the notation key "NO" was used when methodologies for estimating emissions sources were not available or were part of combined activities where emissions are not occurring or are insignificant. The Party further clarified that it would consider assessing the

[3] Landfill Gas Recovery and Energy Production at the Tintareni Landfill Site, Chisinau, Republic of Moldova. See https://cdm.unfccc.int/Projects/Validation/DB/YMADEGM8WLBBM1EBYF5N8SO9SK9LUW/view.html.

emissions from source category 5.B.2 (anaerobic digestion at biogas facilities) in the next inventory cycle to determine the significance of these emissions and depict them accordingly in subsequent reporting. The TTE noted that clarifying the approach used for different notation keys in the relevant categories in the BUR could facilitate a better understanding of the information reported.

40. The NIR provides an update to all GHG inventories reported in previous NCs and BURs. Information is reported in an update to the Party's NC4, which addressed anthropogenic emissions and removals for 1990–2015. The update was carried out for all years in the period 1990–2015 using the methodologies contained in the 2006 IPCC Guidelines, thus generating a consistent 27-year time series. The previous NIR for the period 1990–2015 was prepared using methodologies contained in the 2006 IPCC Guidelines for direct emissions and the Revised 1996 IPCC Guidelines for indirect emissions. The TTE commends the Party for continuing to use the 2006 IPCC Guidelines for a second consecutive NIR.

41. The Party's GHG inventory was prepared with the technical support of the United Nations Environment Programme, which also assisted in coordinating its GHG inventory. The Republic of Moldova described in its BUR the institutional framework for the preparation of its 2016 GHG inventory, including its legal status. CCO has been designated as the GHG inventory preparation agency and is responsible for preparing NIRs and NISs. The Party reports that a centralized approach has been adopted by CCO to facilitate the national GHG inventory process (see figure 2-3 in the BUR), including an NIR and the common reporting format tables, in accordance with decision 24/CP.19. Within CCO, the national inventory team coordinates all GHG-related work, including emission estimation, key category analysis, QA/QC activities, reporting and archiving of data, and NC and BUR preparation.

42. According to the Party, in order to improve the transparency, stability, comparability, completeness and accuracy of the national inventory, it prepared the first NIS in 2015 and submitted it on 5 April 2016 as a technical annex to the first BUR. The Party reported that, as a starting point, it used the six templates developed by the United States Environmental Protection Agency.[4] The NIS includes all institutional and legal arrangements, roles and responsibilities associated with GHG inventory preparation and reporting, including NIRs (chaps. 2.2.1 and 2.2.2 in the BUR). The second NIS was prepared early in 2019 and was submitted on 26 February 2019 as a technical annex to the second BUR. During the technical analysis, the Party informed the TTE that the NSMR was established by Government Decision No. 1277 of 26 December 2018[5], and roles and responsibilities of the competent authority responsible for its implementation had been outlined. The decision entered into force on 8 February 2019, and the newly established Environment Agency was mandated as the competent authority that would guarantee the allocation of state funds for executing the functions of the NSMR. The TTE commends the Republic of Moldova for implementing these sustainable institutional arrangements.

43. The Republic of Moldova reported a key category analysis was performed on the basis of tier 1 and tier 2 approaches for the level of and trend in emissions. A total of 28 sources were identified as key sources, with the energy sector and CO_2 as the key emission sector and most significant GHG, respectively. The key category analysis was carried out using the key category calculation tool developed by the United States Environmental Protection Agency, and the approach provided for key category analysis with and without LULUCF. The TTE commends the Party for conducting and reporting on its key category analysis.

44. The BUR provides information on QA/QC measures for all sectors, including a QA/QC plan developed in 2005 (which is updated once every three to four years) for preparing the Party's GHG inventory. The key features of the QA/QC plan include detailed specific procedures and typical quality control and verification forms in accordance with tier 1 (general procedures) and tier 2 (specific procedures for individual categories)

[4] The template categories are institutional arrangements, assessment methodologies and process documentation, description of QA/QC procedures, description of the archiving system, key category analysis and the national inventory improvement plan.

[5] See http://clima.md/lib.php?l=en&idc=276&.

methodologies. This approach was taken to standardize the process of implementing QA/QC activities for the national inventory. Further, the external technical reviews (audits) are conducted by staff who are not directly involved in the national inventory drafting and development. The TTE commends the Republic of Moldova for reporting these accomplishments.

45. The Republic of Moldova reported information on CO_2 fuel combustion using both the sectoral and the reference approach. Except for the last two years of the reference period, the differences between the two approaches was less than 2.0 per cent; in 2015 and 2016, the difference was 2.4 and 3.5 per cent, respectively. This information was reported in the NIR, however, a reference to this information was not included in the BUR. During the technical analysis, the Party clarified that the next submission would include a more detailed analysis of the difference between the reference and the sectoral approach and that the information would be referenced in the BUR. The TTE noted that reporting information on both the reference and the sectoral approach in the BUR, or including a reference to the section of the NIR where such information is reported, could facilitate a better understanding of the information reported.

46. Information was reported on international aviation and marine bunker fuels. International bunker emission estimates for aviation, which is the only international bunker category for the Republic of Moldova, were generated using a tier 2 approach. The TTE commends the Republic of Moldova for reporting such information in the BUR.

47. The Republic of Moldova reported information on the uncertainty assessment (level and trend) of its national GHG inventory. The uncertainty analysis was based on the tier 1 approach and covers all categories and all direct GHGs. The results obtained, as reported in the BUR, reveal that the level uncertainty for emissions is 7.27 per cent and the trend uncertainty is 2.23 per cent. The TTE commends the Republic of Moldova for providing in its BUR detailed information on the selected uncertainty values for AD and EFs. However, information on assumptions used in the uncertainty analysis was not clearly reported in the BUR. During the technical analysis, the Republic of Moldova explained – as is clearly reported in the sectoral chapters of the NIR (examples were provided to the TTE during the technical analysis) – the uncertainty analysis is based on default values in the case of EFs and on expert judgment in the case of AD. This aspect of the uncertainty analysis, that is, providing more transparent information on underlying assumptions, is regarded as an area for improvement. The TTE noted that the Party reporting more transparent information on the assumptions made in conducting its uncertainty assessment could facilitate a better understanding of the information reported.

48. The TTE noted that the transparency of the information reported on GHG inventories could be further enhanced by addressing the areas noted in paragraphs 36–39, 45 and 47 above.

49. The TTE noted that the Republic of Moldova made improvements in its second BUR in all sectors of the GHG inventory, such as updating AD for past years, moving to higher tier methods, updating country-specific EFs and correcting errors. All improvements made to the second BUR have been documented in the respective chapters of the NIR with descriptions of the planned improvements. During the technical analysis, the Party informed the TTE that it prioritized the necessary improvements according to the results of the key category analysis and cost-efficiency. The TTE commends the Party for enhancing the transparency of the information reported and for its approach in prioritizing its future improvements.

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

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

51. The information reported provides a comprehensive and mostly clear overview of the Party's mitigation actions and their effects. In its BUR, which includes information on national context and changes thereto, the Republic of Moldova frames its national mitigation

planning and action in the context of the LEDS until 2030 and the action plan for its implementation. The Party reported that it is using the LEDS to implement its NDC. The overall objective of the LEDS is consistent with the information outlined in its NDC and will enable the Party to adjust its development path towards a low-carbon economy and achieve green sustainable development based on the country's socioeconomic and development priorities. The Republic of Moldova reported its commitment to achieve its unconditional GHG emissions target of 64–67 per cent below the reference year level (1990) by 2030, which can be increased up to 78 per cent, conditional on receiving donor support. The global target for 2030 is supported by intermediate sectoral targets for 2020 and 2025.

52. The Republic of Moldova reported detailed information on aggregated and sectoral GHG projections. The Party reported that its mitigation analysis for the second BUR is a continuation of the analysis conducted in its NC4. In this regard, the Party reported two scenarios: the WEM scenario, which refers to projections that comply with policies and measures implemented or adopted before 1 January 2018; and the WAM scenario, which reflects policies and measures adopted or under development since 1 January 2018. The Party has not reported a 'business as usual' scenario, because when developing the NDC, the emission target relative to 1990 is used as a reference year. These scenarios were developed for the energy, IPPU, agriculture, LULUCF and waste sectors, and considered the following gases: CO_2, CH_4, N_2O and fluorinated gases. The Party reported that the projections were made for 2020, 2025 and 2030, and the emissions for 1990–2015 are consistent with the historical emissions for sources and sinks reported in the latest NIR for 1990–2016.

53. As reported in the BUR (see figure 4-1), the level of GHG emissions under both the WEM and the WAM scenario is lower than the commitments made by the Republic of Moldova in its NDC. The net emissions in 2030 are expected be lower than the 1990 level by 70.5 per cent under the WEM scenario and by 88.5 per cent under the WAM scenario, when compared with 64–67 per cent and 78 per cent in the unconditional NDC and conditional NDC, respectively. According to the Party, the GHG emission reduction policies that it has developed and implemented over the years will ensure that the country is on track to achieve the overachieving targets set in its NDC. The most significant contributions to achieving these objectives are from the energy and LULUCF sectors (see figure 4-2 in the BUR). The Party also reported information on the methodologies and tools used, key parameters and assumptions. The TTE commends the Party for the detailed and transparent information on projections reported in the BUR.

54. The Party reported a summary of its NAMAs in tabular format in accordance with decision 2/CP.17, annex III, paragraph 11. Additional information is reported in chapters of the BUR. The Party also reported that the NAMAs are aimed at achieving overall and specific objectives of the LEDS. The Party reported that, as indicated in the LEDS, the conditional and unconditional targets outlined in paragraph 51 above can be achieved by implementing 22 and 44 NAMAs, respectively. The information is reported in separate tables for each NAMA for six sectors: energy, transport, IPPU, agriculture, LULUCF and waste. Further, the Party reported information on its climate change mitigation policies for the different sectors, which were reported in its NC4 and remain valid for the second BUR.

55. Consistent with decision 2/CP.17, annex III, paragraph 12(a), the Republic of Moldova reported the names of its NAMAs in the sectors identified in paragraph 54 above. In addition to the information outlined by the reporting provision on name, description, coverage (sector and gases), quantitative goals and progress indicators, the Party reported information outlined in paragraph 12(b–d) of the same decision, as well as quantitative targets and goals.

56. The Party reported mitigation actions related to the energy sector, mainly in the areas of promoting renewable energy sources and enhancing energy efficiency. Information on the methodologies and assumptions used for estimating the impacts of the mitigation actions, the objectives of the mitigation actions and the steps taken to implement the mitigation actions was reported for all actions in this sector. The Party also reported information on the results achieved from the implementation of its mitigation actions, including both estimated outcomes and emission reductions. Further information is presented on the actions with the largest expected emission reductions. The Republic of Moldova has undertaken significant steps in the implementation of the mitigation action involving the construction of electricity

and thermal power generation installations from renewable sources. As at 2017, the total power from renewable energy power plants in operation accounted for about 17 MW, from which 9.19 MW was generated from wind, 5.71 MW from biogas, 2.1 MW from photovoltaics and 0.25 MW from water. In terms of estimated emission reductions, the mitigation actions will account for a minimum of 161.2 kt CO_2 by 2020 and a maximum of 1,126.0 kt CO_2 by 2030. Regarding implementation, during the period 2015–2018, for a mitigation measure related to increasing energy efficiency in existing buildings, constructing new energy-efficient buildings and promoting renewable energy use in the buildings sector, 40 biomass-based heat plants and 20 solar hot water systems were installed in public institutions, and 523 households and micro enterprises benefited from heat generated from green energy. The related emission reductions are about 373.8 kt CO_2 eq in 2020 and 589.2 kt CO_2 eq by 2030, excluding the energy efficiency measures and the promotion of renewable sources related to buildings connected to the centralized heat supply system.

57. Mitigation actions in the transport sector are related to using biofuels and to promoting electric and hybrid transportation in Chisinau municipality. Information on the methodologies and assumptions used for estimating the impacts of the mitigation actions, the objectives of the mitigation actions and the steps taken to implement the mitigation actions was reported for all actions in this sector. The Party also reported information on the results achieved from the implementation of its mitigation actions, including both estimated outcomes and emission reductions. For example, the Republic of Moldova reported an action on promoting public, electric and hybrid transport in Chisinau municipality. The excise tax rate for imported hybrid cars has been reduced by 50 per cent since 2017, and the number of imported hybrid cars has consequently increased by 13 per cent. The estimated emission reductions for 2030 are 21 kt CO_2 eq.

58. For the IPPU sector, the mitigation actions are mainly for improving energy efficiency and promoting renewable energy sources. Information on the methodologies and assumptions used for estimating the impacts of the mitigation actions, the objectives of the mitigation actions and the steps taken to implement the mitigation actions was reported for all actions in this sector. The Party also reported information on the results achieved from the implementation of its mitigation actions, including both estimated outcomes and emission reductions. The Republic of Moldova has undertaken significant steps in the implementation of the mitigation action involving co-incineration of alternative fuels (biomass and municipal solid waste) in the clinker furnace at the Lafarge cement plant, where new formulas for new products have led to a significant reduction in emissions, and where the EF per tonne of cement, reflecting both combustion and process emissions, was reduced by approximately 5.8 per cent between 1990 and 2016. The total CO_2 emission reduction from the fuel combustion and process is projected to be 15–30 kt CO_2 by 2020 under the WAM scenario and 35–40 kt CO_2 by 2030 under the WEM scenario.

59. In the agriculture sector, mitigation actions are mainly in the areas of improving the livestock and poultry population by promoting highly productive breeds, and enhancing manure management, soil conservation and fertility. Information on the methodologies and assumptions used for estimating the impacts of the mitigation actions, the objectives of the mitigation actions and the steps taken to implement the mitigation actions was reported for all actions in this sector. Information on the progress of implementation was also reported, such as on the improving the livestock population action, for which the goal is to ensure agrifood security and efficient productivity of meat, milk and eggs through promoting highly productive breeds. Several documents have been approved and are under implementation (e.g. a dairy cattle breeding programme for 2014–2020 and a sheep and goat breeding programme for 2014–2020). The Party also reported information on the results achieved from the implementation of its mitigation actions. The expected emission reductions are related to CH_4 emissions from enteric fermentation, which account for about 1,393 kt CO_2 eq by 2030 compared with the reference year under the WEM scenario and for about 1,419 kt CO_2 eq by 2030 under the WAM scenario.

60. The mitigation actions related to the LULUCF sector are mainly in the areas of expansion of wooded areas and rehabilitation of forest belts for protecting agricultural fields. Information on the methodologies and assumptions used for estimating the impacts of the mitigation actions, the objectives of the mitigation actions and the steps taken to implement

the mitigation actions was reported for all actions in this sector. For example, the mitigation action Moldova Soil Conservation Project[6] registered significant progress: project documents were developed, approximately 20,300 ha forestry crops were planted and groomed, and the project achieved 1,205 kt CO_2 eq emission reductions during 2012–2016. The expected emission reduction by 2022 is about 3,600 kt CO_2 eq.

61. For the waste sector, the mitigation actions are mainly in the areas of solid waste management and wastewater treatment. Information on the methodologies and assumptions used for estimating the impacts of the mitigation actions, the objectives of the mitigation actions and the steps taken to implement the mitigation actions was reported for all actions in this sector. The information reported demonstrates significant progress in implementing the mitigation action related to wastewater treatment: the Grozeşti water treatment plant was put into operation and an associated 16.8 km aqueduct and a 101.8 km distribution network were built, regional projects to modernize water and sanitation services are under implementation and a platform for installing a container for sludge dewatering has been finalized. It is expected that, by 2030, the emission reductions will account for 143.91 kt CO_2 eq.

62. The Republic of Moldova provided information on its involvement in international market mechanisms as a Party to the Kyoto Protocol. With the aim of capitalizing on GHG emission reduction potential through the CDM, the Party reported that it has established the relevant institutions and regulatory and information frameworks. In this regard the designated national authority was established under MARDE. CCO and the Carbon Finance Office collaborate on implementing CDM-related activities. Ten CDM projects have been approved by the designated national authority and another eight verified under the CDM process. Implementation of these projects is expected to achieve annual GHG emission reductions of approximately 1.5 Mt CO_2 eq.

63. The Republic of Moldova reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The draft government decision on the establishment of a climate change coordination mechanism, which is currently under consideration by the Government, will constitute the needed framework for implementing the MRV system in the Republic of Moldova. The Party reported that the key element in the climate change coordination mechanism is the National Commission, an interministerial body consisting of representatives of central and local public authorities, academia, non-governmental organizations and the private sector, which will ensure the coordination of the institutional framework for MRV of the GHG emission reductions and facilitate mainstreaming climate change issues into national and sectoral planning documents. The National Commission will coordinate actions previously initiated but not completed in the context of the Kyoto Protocol. The Commission also aims to coordinate the development, assessment and approval process for NAMA projects.

64. In paragraph 46 of the summary report on the technical analysis of the Republic of Moldova's first BUR, the previous TTE noted where the transparency of reporting on the methodologies and assumptions used to estimate the emission reductions of the mitigation actions could be further enhanced. The current TTE noted that the Republic of Moldova took into consideration this area for improvement in chapter 6.2 of and in annex 2 to its second BUR, and commends the Party for enhancing the transparency of the information reported. The TTE further commends the Republic of Moldova for increasing the number of detailed mitigation actions presented in annex 2 to the second BUR, for implementing activities for extending the MRV system associated with the mitigation actions, such as through elaborating the draft government decision on the establishment of a climate change coordinating mechanism, and for extending the presentation of specific elements related to the MRV system associated with the mitigation actions in chapter 6.2 of the second BUR.

[6] See https://cdm.unfccc.int/Projects/DB/SGS-UKL1216031019.22/view.

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

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

66. The Republic of Moldova reported detailed sectoral information on constraints and gaps and related financial, technical and capacity-building needs, in accordance with decision 2/CP.17, annex III, paragraph 14. The information focused on the sectors with directly reported mitigation of GHG emissions, namely energy, transport, buildings and industry. The Party reported that the constraints are related to mitigation and are based on the same constraints reported in the NC4 and that the detailed information reported in the BUR provides an update. The Party identified extensive sectoral constraints for the agriculture, buildings and waste sectors, which impact mitigation through direct GHG emissions (see chap. 5.1 of the BUR). The Republic of Moldova reported that climate change mitigation capacity is understood as the ability of individuals, groups, organizations and institutions to identify, plan and implement climate change mitigation and adaptation actions, as well as being an integral part of sustainable development efforts. The capacity-building needs that were identified also focused on mitigation, included those identified in the BUR and referenced those identified in the NC4 (see findings in chap. II.D below). The information reported on both financial and technical needs aimed at ensuring low-carbon development. Detailed information on the financial needs is reported in table 5.3 of the BUR.

67. The Republic of Moldova reported information on financial and technical support received throughout 2012–2016 in accordance with decision 2/CP.17, annex III, paragraph 15. In its BUR, the Republic of Moldova reported that external assistance was provided as follows: European Union, EUR 393.1 million; United States of America, EUR 321.4 million; World Bank, EUR 283.1 million; United Nations, EUR 161.3 million; and Romania, EUR 185.4 million. These five donors account for 76 per cent of the amount of external assistance disbursed in 2016 for the Republic of Moldova, and the remaining 24 per cent comprised contributions from 11 donors. The Republic of Moldova reported that it received USD 352,000 as a grant and USD 37,000 as co-financing from the Global Environment Facility for the preparation of its second BUR. Since joining the Global Environment Facility, the Republic of Moldova has received non-repayable financial support totalling USD 176.11 million, and USD 515.08 million in co-financing for 46 projects, including 10 projects related to climate change. The Republic of Moldova reported that, in 2016, the main sectors that benefited from external assistance projects were agriculture (19.6 per cent), transport and roads (18.6 per cent), health (18.6 per cent) and energy (14.9 per cent), and other projects, including those relating to climate change, also benefited (28.3 per cent). During the technical analysis, the Party provided additional information on translating the identified needs into financial, technical, technology and capacity-building needs.

68. The Party reported detailed information on technology transfer and identified three major aspects to ensuring efficient technology transfer: capacity-building, an enabling business environment and technology transfer mechanisms. The Party reported that since 2010, 10 industrial parks have been established, and it has developed an enabling legal framework for long- and medium-term small and medium enterprise development. In 2018, the Republic of Moldova amended the Code on Science and Innovation, and a national system of science and innovation reform came into force. The TTE commends the Republic of Moldova for its national efforts to enhance technology transfer.

69. The Republic of Moldova reported information on nationally determined technology needs with regard to the development and transfer of technology in accordance with decision 2/CP.17, annex III, paragraph 16. In its BUR the Party reported that the technology needs assessment was nationally determined. The technology needs assessment was the basis for the technology needs reported in the BUR. During the technical analysis, the Republic of Moldova clarified that nationally determined technology needs had been identified recently

under the framework of two implemented projects,[7] and 136 nationally determined technologies and project ideas had been considered and prioritized. On the basis of this process, 12 NAMAs had been developed and registered in the NAMA Registry (BUR, table 5-1). All NAMAs foreseen in the LEDS of the Republic of Moldova until 2030 and the action plan for its implementation, approved through Government Decision No. 1470 of 30 December 2016, are reflected in annex 2 to the second BUR. The TTE noted that the Party clarifying the national efforts made to determine technology needs in the BUR could facilitate a better understanding of the information reported.

70. The Republic of Moldova has reported comprehensive and transparent information on financial resources, technology transfer, capacity-building and technical support received. The TTE commends the Party for its efforts.

5. Any other information

71. The Republic of Moldova reported information on integrating climate change mitigation into social, economic and environmental policies and technology transfer related activities to mitigate climate change, including information related to technology transfer mechanisms. The Party reported some information on actions related to adaptation actions that may lead to GHG emission reductions, such as a global climate strategy and action plan for long-term climate change mitigation and adaptation and the World Bank Group Country Partnership Strategy for the Republic of Moldova, which will assist the Party on three main pillars, including enhancing climate change adaptation and resilience.

D. Identification of capacity-building needs

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

(a) Enhancing national capacity to prepare GHG inventories by:

(i) Using the new common reporting format tables, to be approved for reporting purposes under the transparency framework referred to in Article 13 of the Paris Agreement;

(ii) Using the new CRF Reporter software via the submission portal;

(b) Enhancing national capacity to apply methodologies that would enable national experts to identify and report all gases covered by the Party's mitigation actions;

(c) Enhancing national institutional arrangements to implement European Union standards on climate change mitigation;

(d) Enhancing national capacity to mobilize, track and report on financial resources through various channels.

73. The TTE noted that, in addition to those identified during the technical analysis, the Republic of Moldova reported the following capacity-building needs in its BUR:

(a) GHG inventory preparation, which involves:

(i) Enhancing the level of knowledge of national experts and institutions involved in developing the national GHG inventory by organizing a series of thematic training workshops;

(ii) Enhancing the professional skills of national experts and institutions involved in developing the inventory process, with the purpose of realizing the gradual transition from default EFs and tier 1 methodologies to country-specific EFs and tier 2 and 3 methodologies, particularly in the case of key categories;

[7] Enabling activities for the preparation of the technology needs assessment report to the UNFCCC, supported by the United Nations Environment Programme (2011–2013); and the Low Emissions Capacity Building Programme (2014–2016), implemented by the United Nations Development Programme with the support of the European Union and the Governments of Australia and Germany.

(b) The GHG statistical accounting system:

(i) Strengthening the newly established (in 2019) institutional arrangements in order to ensure the continuous development of national GHG inventories;

(ii) Enhancing the data management system used in each inventory cycle, as well as the periodic archiving of the inventory and the documentation on how the inventory was drawn up, in order to comply with the principle of transparency;

(iii) Making improvements to the QA/QC procedures, mostly by improving the efficiency of the application thereof, but also by attracting experts with higher qualifications from abroad and involving them in this exercise, especially for QA;

(c) Climate change mitigation, which covers four dimensions (reported in detail in chaps. 10.2.1–10.2.4 of the NC4):

(i) Capacity to carry out climate studies, research and assessments;

(ii) Capacity to formulate and implement strategies and climate policies;

(iii) Capacity to implement climate strategies and policies;

(iv) Capacity to negotiate climate change issues at the international level.

III. Conclusions

74. The TTE conducted a technical analysis of the information reported in the second BUR of the Republic of Moldova in accordance with the UNFCCC reporting guidelines on BURs. The TTE concludes that the reported information is fully 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, 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 any other information relevant to the achievement of the objective of the Convention. The TTE concluded that the information analysed is mostly transparent.

75. The Republic of Moldova reported information on the institutional arrangements relevant to the preparation of its BURs. MARDE is the state authority vested with the responsibility to develop and promote policies and strategies addressing climate change. The National Commission is the supreme authority responsible for implementing provisions and mechanisms of the Convention and its Kyoto Protocol, and it collaborates with an interministerial steering committee to execute its tasks. The secretary of the National Commission is the manager of CCO. During the period 2004–2018, CCO was responsible for activities related to the preparation of NCs and BURs, and it took significant steps to create institutional arrangements that allow for the sustainable preparation of the Party's BURs. These included implementing organizational improvements and knowledge-sharing procedures to facilitate sectoral information transfer. Since 2018, the newly created Environment Agency has been responsible for areas related to climate change, including providing technical support to MARDE in preparing NCs and BURs. In 2019, the Environment Agency became the competent authority responsible for implementing the NSMR.

76. In its second BUR, submitted initially on 27 December 2018 and resubmitted on 19 April 2019, the Republic of Moldova reported information on its national GHG inventory for 1990–2016, including GHG emissions and removals of CO_2, CH_4 and N_2O for all relevant sources and sinks as well as the precursor gases. Estimates of fluorinated gases were also provided. The inventory was developed on the basis of the 2006 IPCC Guidelines for direct GHGs and the *EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016* (EMEP/EEA, 2016) for precursor gases and SO_2. The total GHG emissions for 2016 were reported as 14.58 Mt CO_2 eq (excluding LULUCF) and 13.66 Mt CO_2 eq (including LULUCF). A total of 28

key categories were identified, with CO_2 and the energy sector identified as the main gas and the sector with the most key categories, respectively. The Republic of Moldova submitted two comprehensive documents in conjunction with its second BUR, namely an NIR and an NIS. The TTE commends the Party for this accomplishment and the comprehensive reporting in all three reports.

77. The Republic of Moldova reported information on mitigation actions and their effects. The Party frames its national mitigation planning and actions in the context of the LEDS until 2030 and the action plan for its implementation. The global objective of the LEDS matches the strategy of the NDC under the Paris Agreement; the Republic of Moldova committed to unconditionally reducing its GHG emissions by 64–67 per cent below the reference year level (1990) by 2030, while the commitment can be increased up to 78 per cent, conditional on receiving donor support. The Republic of Moldova reported actions that are ongoing, which occur in several sectors, including energy, transport, IPPU, agriculture, LULUCF and waste. The key mitigation actions are constructing electricity and thermal power generation plants from renewable sources, increasing energy efficiency in existing buildings, building new energy-efficient buildings, promoting renewable energy use in the buildings sector, improving the livestock population by promoting highly productive breeds, and scaling up the Moldova Soil Conservation Project. Among these, the mitigation action on improving the livestock population has the highest expected emission reductions: about 1.42 Mt CO_2 eq by 2030 under the WAM scenario.

78. The Republic of Moldova reported information on key constraints, gaps and related needs on a sectoral level, including for energy, transport, buildings, industry, agriculture and waste, which impact mitigation through direct GHG emissions. The Party identified three major aspects to ensuring efficient technology transfer: capacity-building, an enabling business environment and technology transfer mechanisms. Information on support received and needed was reported. Information on technology needs and technology needed and received was also reported in the BUR.

79. The TTE, in consultation with the Republic of Moldova, identified the four main capacity-building needs listed in chapter II.D above and needs for capacity-building that aim to facilitate reporting in accordance with the UNFCCC reporting guidelines on BURs and participation in ICA in accordance with the ICA modalities and guidelines, taking into account Article 4, paragraph 3, of the Convention. The Republic of Moldova prioritized all the capacity-building needs in paragraphs 72 and 73 above.

Annex I

Extent of the information reported by the Republic of Moldova 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 the Republic of Moldova

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	The Republic of Moldova originally submitted its second BUR in December 2018; 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	The Republic of Moldova 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;	Yes	The Republic of Moldova has reported comparable information in annex I to the second BUR.
	(b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines.	Yes	The Republic of Moldova has reported comparable information in annex I to the second BUR.
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	
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	
Decision 2/CP.17, annex III, paragraph 9	The inventory section of the BUR should consist of a NIR as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National greenhouse gas inventories), including:	Yes	
	(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 annex I to the second BUR.

Decision	*Provision of the reporting guidelines*	*Yes/partly/ no/NA*	*Comments on the extent of the information provided*
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6).	Yes	Comparable information was reported in annex I to the second BUR.
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex.	Yes	The Party submitted an NIR and an NIS as annexes to its second BUR.
Decision 17/CP.8, annex, paragraph 12	Non-Annex I Parties are also encouraged, to the extent possible, to undertake any key source analysis as indicated in the IPCC good practice guidance to assist in developing inventories that better reflect their national circumstances.	Yes	
Decision 17/CP.8, annex, paragraph 13	Non-Annex I Parties are encouraged to describe procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories, as well as efforts to make this a continuous process, including information on the role of the institutions involved.	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;	Yes	
	(b) CH_4;	Yes	
	(c) N_2O.	Yes	
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:		
	(a) HFCs;	Yes	
	(b) PFCs;	Yes	
	(c) SF_6.	Yes	
Decision 17/CP.8, annex, paragraph 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emissions by sources of other GHGs, such as:		
	(a) CO;	Yes	
	(b) NO_X;	Yes	
	(c) NMVOCs.	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	SO_2 emissions have been reported.
Decision 17/CP.8, annex, paragraph 18	Non-Annex I Parties are encouraged, to the extent possible, and if disaggregated data are available, to estimate and report CO_2 fuel combustion emissions using both the sectoral and the reference approach and to explain any large differences between the two approaches.	Yes	
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:		
	International aviation;	Yes	
	Marine bunker fuels.	N/A	The Republic of Moldova is a landlocked country.

Decision	*Provision of the reporting guidelines*	*Yes/partly/ no/NA*	*Comments on the extent of the information provided*
Decision 17/CP.8, annex, paragraph 20	Non-Annex I Parties wishing to report on aggregated GHG emissions and removals expressed in CO_2 eq should use the GWP provided in the AR2 based on the effects of GHGs over a 100-year time-horizon.	NA	The Party used the GWP provided in the AR4.
Decision 17/CP.8, annex, paragraph 21	Non-Annex I Parties are encouraged to provide information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol, including a brief explanation of the sources of EFs and AD. If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe the source and/or sink categories, methodologies, EFs and AD used in their estimation of emissions, as appropriate. Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building:	Yes	
	(a) Information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol;	Yes	The Republic of Moldova used the 2006 IPCC Guidelines. A tier 1 methodology was used for the energy sector. A combination of tier 1, 2 and 3 methodologies was used for the other sectors.
	(b) Explanation of the sources of EFs;	Yes	
	(c) Explanation of the sources of AD;	Yes	
	(d) If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe:	NA	The Republic of Moldova used the 2006 IPCC Guidelines.
	Source and/or sink categories;		
	Methodologies;		
	EFs;		
	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	
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	

Decision	*Provision of the reporting guidelines*	*Yes/partly/ no/NA*	*Comments on the extent of the information provided*
	(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 the Republic of Moldova

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	
Decision 2/CP.17, annex III, paragraph 12	For each mitigation action or group of mitigation actions, including, as appropriate, those listed in document FCCC/AWGLCA/2011/INF.1, developing country Parties shall provide the following information, to the extent possible:		
	(a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indicators;	Yes	
	(b) Information on:		
	(i) Methodologies;	Yes	
	(ii) Assumptions;	Yes	
	(c) Information on:		
	(i) Objectives of the action;	Yes	
	(ii) Steps taken or envisaged to achieve that action;	Yes	
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Yes	
	(ii) Progress of implementation of the underlying steps taken or envisaged;	Yes	
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Yes	
	(e) Information on international market mechanisms.	Yes	
Decision 2/CP.17, annex III, paragraph 13	Parties should provide information on domestic MRV arrangements.	Yes	

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

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, 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;	Yes	
	(b) Technology support received.	Yes	Detailed information was reported in chapter 7 of the BUR.

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

A. Reference documents

EMEP/EEA (European Monitoring and Evaluation Programme/European Environment Agency). 2016. *EMEP/EEA Air Pollutant Emission Inventory Guidebook 2016: Technical Guidance to Prepare National Emission Inventories.* Copenhagen: EEA. Available at https://www.eea.europa.eu/publications/emep-eea-guidebook-2016.

First and second BURs of the Republic of Moldova. Available at http://unfccc.int/8722.php.

First, second, third and fourth NCs of the Republic of Moldova. Available at: http://unfccc.int/national_reports/non-annex_i_natcom/items/2979.php.

IPCC. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. JL Houghton, LG Meira Filho, B Lim, et al. (eds.). Paris, France: 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.ipccnggip.iges.or.jp/public/gp/english.

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

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

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

B. Additional information provided by the Party

The following documents[1] were provided by the Party in response to requests for technical clarification during the technical analysis:

National Bureau of Statistics of the Republic of Moldova (2009 and 2016), *Agricultural Activity of Households and Farms in the Republic of Moldova* (in Romanian language).

National Bureau of Statistics of the Republic of Moldova (2009 and 2016), Statistical Reports 9-AGR. *The use of phytosanitary products and the introduction of synthetic and organic fertilizers in the crop yield of the year* (in Romanian language).

Government Decision No. 1277 of 26.12.2018 on the Establishment and Functioning of the National System for Monitoring and Reporting Greenhouse Gas Emissions and other Information Relevant to Climate Change. Published: 08.02.2019 in Official Journal No. 38-47 Art. No: 67. Date of entry into force: 08.02.2019 (in English language). Available at: http://clima.md/lib.php?l=en&idc=276.

[1] Reproduced as received from the Party.

Time series data on the indicators for 1990-2016, Table B-3: Greenhouse gas emissions (GHG): Republic of Moldova. Published on 29.06.2018. Available at: http://clima.md/libview.php?l=ro&id=3628&idc=264.

NAMA projects submitted by the Republic of Moldova to the UNFCCC for recognition. Available at: http://clima.md/lib.php?l=en&idc=278.