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Technical analysis of the third biennial update report of Tunisia submitted on 28 December 2022

Summary report by the team of technical experts

Summary

According to decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention, consistently with their capabilities and the level of support provided for reporting, were to submit their first biennial update report by December 2014. Further, paragraph 41(f) of that decision states that Parties not included in Annex I to the Convention shall submit a biennial update report every two years, either as a summary of parts of their national communication in the year in which the national communication is submitted or as a stand-alone update report. As mandated, the least developed country Parties and small island developing States may submit biennial update reports at their discretion. This summary report presents the results of the technical analysis of the third biennial update report of Tunisia, 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	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
2019 Refinement to the 2006 IPCC Guidelines	<i>2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
AD	activity data
AFOLU	agriculture, forestry and other land use
ANME	Tunisian energy conservation agency
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BUR	biennial update report
CDM	clean development mechanism
CER	certified emission reduction
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
COPERT	software tool for calculating road transport emissions
CORINAIR	Core Inventory of Air emissions
EEA	European Environment Agency
EF	emission factor
EMEP	Cooperative Programme for Monitoring and Evaluation of the Long-range Transmission of Air Pollutants in Europe
ETF	enhanced transparency framework under the Paris Agreement
F-gas	fluorinated gas
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
HWP	harvested wood products
ICA	international consultation and analysis
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	<i>Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories</i>
IPCC good practice guidance for LULUCF	<i>Good Practice Guidance for Land Use, Land-Use Change and Forestry</i>
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
N ₂ O	nitrous oxide
NA	not applicable
NAMA	nationally appropriate mitigation action
NC	national communication
NDC	nationally determined contribution
NIR	national inventory report
NMVOC	non-methane volatile organic compound
non-Annex I Party	Party not included in Annex I to the Convention
NO	not occurring
NO _x	nitrogen oxides
PFC	perfluorocarbon
PV	photovoltaic
QA/QC	quality assurance/quality control

Revised 1996 IPCC Guidelines	<i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</i>
SF ₆	sulfur hexafluoride
SO ₂	sulfur dioxide
TTE	team of technical experts
UGPO	Target-based Management Unit
UNFCCC guidelines for the preparation of NCs from non-Annex I Parties	“Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention”
UNFCCC reporting guidelines on BURs	“UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention”

I. Introduction and process overview

A. Introduction

1. The process of ICA consists of two steps: a technical analysis of the submitted BUR and a facilitative sharing of views under the Subsidiary Body for Implementation, resulting in a summary report and a record respectively.
2. According to decision 2/CP.17, paragraph 41(a), non-Annex I Parties, consistently with their capabilities and the level of support provided for reporting, were to submit their first BUR by December 2014. In addition, paragraph 41(f) of that decision states that non-Annex I Parties shall submit a BUR every two years, either as a summary of parts of their NC in the year in which the NC is submitted or as a stand-alone update report.
3. Further, according to paragraph 58(a) of the same decision, the first round of ICA is to commence for non-Annex I Parties within six months of the submission of the Parties' first BUR. The frequency of developing country Parties' participation in subsequent rounds of ICA, depending on their respective capabilities and national circumstances, and the special flexibility for small island developing States and the least developed country Parties, will be determined by the frequency of the submission of BURs.
4. Tunisia submitted its second BUR on 31 December 2016, which was analysed by a TTE in the eighth round of technical analysis of BURs from non-Annex I Parties, conducted from 22 to 26 May 2017. After the publication of its summary report, Tunisia participated in the sixth workshop for the facilitative sharing of views, convened in Katowice, Poland, on 7 December 2018.
5. This summary report presents the results of the technical analysis of the third BUR of Tunisia, 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, Tunisia submitted its third BUR on 28 December 2022 as a stand-alone update report. The submission was made within six years after 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 delay was due to ongoing political, social and economic crises; lack of a stable institutional framework; and the effects of the coronavirus disease 2019.
8. The technical analysis of Tunisia's BUR was conducted from 19 to 23 June 2023 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: Menouer Boughedaoui (former member of the Consultative Group of Experts from Algeria), Yoisy Castillo (Panama), Svetlana Gaidashova (Rwanda), Thomas Grammig (Germany), Benoit Mayer (France), Mame Coumba Ndiaye (Senegal) and Robert Pismo (Cameroon). Menouer Boughedaoui and Benoit Mayer were the co-leads. The technical analysis was coordinated by Mirana Andriarisoa and Gopal Joshi (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 Tunisia engaged in consultation¹ on the identification of capacity-building needs for the preparation of BURs and participation in the ICA process. Following the technical analysis of Tunisia's third BUR, the TTE prepared and shared a draft summary report with Tunisia

¹ The consultation was conducted via videoconferencing.

on 6 February 2024 for its review and comment. Tunisia, in turn, provided its feedback on the draft summary report on 4 August 2026.

10. The TTE finalized the summary report in consultation with the Party on 4 August 2026.

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 Tunisia's BUR outlined in paragraph 11 above.

B. Extent of the information reported

13. The elements of information referred to in paragraph A.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 13 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 Tunisia's third BUR compared with that in its previous BUR. Information on the GHG inventory (excluding the AFOLU sector), mitigation actions and their effects, and needs and support reported in the Party's third BUR demonstrates that it has taken into consideration the areas for enhancing the transparency of the extent of the information reported noted by the previous TTE in the summary report on the technical analysis of the Party's previous BUR.

C. Technical analysis of the information reported

16. The technical analysis referred to in paragraph A.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, Tunisia provided an update on its national circumstances, including a description of national development priorities, objectives and circumstances, including features of geography, climate and economy that might affect the Party's ability to deal with mitigating and adapting to climate change, as well as information on national circumstances and constraints in relation to 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, paragraphs 9–10, of the Convention.

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

22. Tunisia transparently reported in its third BUR an update on its existing institutional arrangements relevant to the preparation of its NCs and BURs on a continuous basis. The description covers key aspects of the institutional arrangements, including the legal status and roles and responsibilities of the overall coordinating entity; the involvement and roles of other institutions and experts; the components of Tunisia's national MRV system, including those for preparing the national GHG inventory, monitoring and evaluating mitigation measures, and tracking support; mechanisms for information and data exchange; QA/QC procedures; and provisions for public consultation and other forms of stakeholder engagement.

23. The Ministry of Environment is responsible for coordinating all processes with the help of UGPO, which was established in 2018 and has two consultative committees (on adaptation and mitigation) and a subunit for partnerships and means of implementation. The Party has also set up a working group in charge of GHG inventories, which falls under the supervision of ANME and has three subsectoral groups (in energy and industrial processes; AFOLU; and solid waste and sanitation). These groups and committees are mostly composed of representatives of relevant ministries and other national stakeholders. ANME is responsible for compiling the national inventory.

24. Tunisia reported in its third BUR an update on its domestic MRV arrangements. The description covers key aspects of the institutional arrangements, the current situation and areas for improvement. The MRV arrangements are designed at the national level and cover three main areas: the GHG inventory information system, an MRV system for mitigation covering the energy sector (energy efficiency, transport, buildings and cement industry) and an upstream data-collection system for mitigation covering other sectors (AFOLU, solid waste and sanitation). MRV for the GHG inventory system is coordinated by UGPO. The MRV system for mitigation uses EnerInfo (the national system for energy conservation), an application called MRV Actions, and sectoral MRV tools for the transport, AFOLU, solid waste and sanitation sectors, and for the cement industry. Tunisia plans to improve the overall system to include other components, such as MRV for support needed and received, and will

build on the existing systems, processes and infrastructure, rendering the improvements cost-effective.

25. Tunisia reported in its BUR (section 2.2) information on its current initiatives for enhancing its institutional arrangements for compliance with requirements under the ETF. The initiatives relate to taking steps to address technical issues; improving organizational and regulatory arrangements and capacity-building efforts currently being planned to more closely comply with relevant international reporting guidelines; and upgrading the sectoral MRV systems to ensure a more consistent approach to data and information collection, monitoring and analysis across sectors. The TTE commends the Party for the clear and comprehensive reporting on its proactive approach to preparing for ETF implementation.

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

26. As indicated in table I.1, Tunisia 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.

27. Tunisia submitted its third BUR in 2022 and the GHG inventory reported is for 2010–2021. The GHG inventory is consistent with the requirements for the reporting time frame.

28. Tunisia referenced its NIR in its BUR. During the technical analysis, the Party clarified that the NIR was being finalized. A draft version of the NIR was submitted to the TTE as part of the technical clarification provided during the technical analysis. The final document was submitted to the secretariat on 4 February 2024 and is publicly available.

29. GHG emissions and removals for the BUR covering the 2010–2021 inventories were estimated using tier 1 methodologies from the 2006 IPCC Guidelines, except for some subcategories in the energy sector (related to gasoline, gasoil, natural gas and biomass (and fugitive emissions)), the IPPU sector (refrigeration and air conditioning, electrical equipment, iron and steel production) and the waste sector (CO₂ emissions from incineration and open burning of waste), where tier 2 methods were used, and some subcategories under mineral industry (cement production and carbonates) and chemical industry (nitric acid production), where tier 3 methods were used. The TTE commends the Party for using the 2006 IPCC Guidelines.

30. Only partial information on methodologies and tiers used for the energy, IPPU and waste sectors was included in Tunisia's BUR. Tunisia indicated that it used a tier 2 method for estimating emissions from gasoline, gasoil, natural gas and biomass in the energy sector but did not clearly describe or document the methodologies used or indicate the sources used for deriving the country-specific EFs. In addition, the information relating to methodologies for AFOLU categories (BUR section 3.4.4.1, p.122) is very general, and information on the tiers used and more in-depth explanations are missing for all categories. During the technical analysis, the Party provided a number of related documents and worksheets and clarified that the information they contain will be reported in the NIR, a draft version of which was provided during the technical analysis. The TTE noted that, although the methodologies were not clearly described in the draft NIR, the document is yet to be finalized and will soon be submitted to the secretariat.

31. Information on AD used and their sources was reported for almost all categories in all sectors, while information on EFs used and their sources was reported for the energy, IPPU and waste sectors.

32. Information on EFs used for the AFOLU sector, the AD used for AFOLU categories 3.B (except subcategory 3.B.2) and 3.D.1, and the specific changes to EFs or AD since the previous BUR for all sectors was not reported in Tunisia's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that information on the EFs used for the AFOLU sector and the specific changes to EFs or AD for all sectors will be included in the NIR and the missing information on AD is available but is stored in large interlinking spreadsheet files, and reporting it therefore presents challenges.

33. Information on the Party's total GHG emissions by gas for 2021 is outlined in table 1 in Gg CO₂ eq. It shows an increase in emissions of 9.8 per cent without the land and HWP categories since 2010 (41,960.35 Gg CO₂ eq).

Table 1

Greenhouse gas emissions by gas of Tunisia for 2021

<i>Gas</i>	<i>GHG emissions (Gg CO₂ eq) including land and HWP^a</i>	<i>% change 2010–2021</i>	<i>GHG emissions (Gg CO₂ eq) excluding land and HWP^a</i>	<i>% change 2010–2021</i>
CO ₂	22 859.81	–1.1	33 564.14	11.3
CH ₄	8 988.59	–1.6	8 988.59	–1.6
N ₂ O	2 552.24	1.5	2 552.24	1.5
HFCs	957.69	552.6	957.69	552.6
PFCs	NA	NA	NA	NA
SF ₆	7.41	–9.7	7.41	–9.7
Other	NA	NA	NA	NA
Total	35 365.74	1.3	46 070.07	9.8

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

34. The TTE noted that some figures relating to GHG emissions were reported inconsistently in various BUR tables, particularly for the IPPU sector. During the technical analysis, Tunisia shared a number of Excel calculation spreadsheets, which were used by the TTE to compile tables 1 and 2 of this report.

35. Information on other emissions was reported, including 90.06 Gg NO_x, 273.32 Gg CO and 35.45 Gg NMVOCs for the energy, waste and AFOLU sectors and 27.78 Gg sulfur oxides for the energy and waste sectors.

36. Tunisia applied notation keys in tables where numerical data were not provided for some categories in the energy sector. The use of those notation keys was consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties.

37. Tunisia did not apply notation keys in tables where numerical data were not provided for the IPPU, AFOLU and waste sectors and some energy sector categories, reporting emissions as “0” for many categories. During the technical analysis, Tunisia recognized that using notation keys would increase transparency but explained that this could not be done owing to lack of data for some categories (e.g. for the waste sector) and time constraints. The Party provided an unofficial Excel file for the AFOLU sector, explaining the status of each category using notation keys. However, the file did not include information for some subcategories (e.g. 3.C.7, 3.C.8, 3.B.5 and 3.B.6). The Party clarified that the correct notation key for subcategories 3.C.7 and 3.C.8 is “NO”, and that urea has not been used in the country since 2012, which is why information and notation keys were not reported for subcategory 3.C.3 (urea application) for years after 2012.

38. Tunisia reported comparable information addressing the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines.

39. The Party did not report comparable information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF (such as the annual changes in carbon stocks in living biomass, dead organic matter and soils). During the technical analysis, Tunisia clarified that the tables will be addressed in future submissions. The Party explained that it faces significant challenges when compiling and reporting such information, such as time constraints, large interlinking data files that are not easy to manage and limited understanding of the requirements of the IPCC good practice guidance for LULUCF.

40. Information on the energy, IPPU and waste sectors was disaggregated in accordance with the 2006 IPCC Guidelines in the BUR; however, data for some categories in the AFOLU sector (e.g. 3.A livestock, 3.B land and 3.C aggregate sources and non-CO₂ emissions sources on land) were not disaggregated in accordance with the 2006 IPCC Guidelines. During the

technical analysis, the Party provided the disaggregated data in Excel files, which indicate that the necessary information is available but was not reported.

41. The shares of emissions that different sectors contributed to the Party's total GHG emissions excluding land and HWP (category 3.B and, if reported, 3.D), as reported by the Party, in 2021 are reflected in table 2.

Table 2

Shares of greenhouse gas emissions by sector of Tunisia for 2021

<i>Sector</i>	<i>GHG emissions (Gg CO₂ eq)</i>	<i>% share^a</i>	<i>% change 2000–2021</i>
Energy	30 615.92	66.4	5.5
IPPU	6 275.78	13.6	12.8
AFOLU	–5 158.85	NA	–113.4
Livestock (category 3.A)	2 882.97	6.3	–2.1
Land (category 3.B)	–13 430.89	NA	28.8
Aggregate sources and non-CO ₂ emissions sources on land (category 3.C)	2 662.51	5.8	58.6
HWP and other emissions (category 3.D)	2 726.56	NA	–19.5
Waste	3 632.88	7.9	31.3

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

42. Tunisia reported information on its use of GWP values consistent with those provided by the IPCC in its AR4 based on the effects over a 100-year time-horizon of GHGs.

43. For the energy sector, information was clearly reported on GHG emissions, methodological tier levels, AD and their sources, EFs and key categories. Tunisia also noted in its BUR all improvements in the information reported since its last submission. The TTE noted that the country-specific EF for CO₂ emissions for gasoil consumption was developed on the basis of data provided by a Tunisian company, and the EF for CO₂ emissions for natural gas was revised using data on the composition of Tunisian and Algerian gas and their respective share in the national mix of natural gas. Fuel consumption for road transportation was disaggregated by vehicle type on the basis of a national study conducted in 2016. Emissions from venting and flaring were estimated for each activity under oil and gas production, for gas transport relating to the Trans Tunisian Gas Pipeline and its compressor stations, and for the national gas transport and distribution grid using AD on the volume of vented and flared gas provided by the National Observatory for Energy and Mines and the country-specific EFs for CO₂ and CH₄.

44. Tunisia did not separately report emissions from domestic navigation, fishing and agricultural off-road vehicles in its BUR. However, the Party provided relevant clarification in its BUR, explaining that all fuel consumption for navigation was classified under international bunkers because domestic navigation was considered negligible, while emissions from fishing and agricultural off-road vehicles could not be separately estimated owing to a lack of disaggregated data on fuel consumption.

45. For the IPPU sector, information was reported on GHG emissions for categories 2.A mineral industry (cement production, lime production, glass production, other process uses of carbonates, ceramics), 2.B chemical industry (nitric acid production), 2.C metal industry (iron and steel), 2.D non-energy products from fuels and solvent use (lubricant use, paraffin wax use, solvent use), 2.F product uses as substitutes for ozone-depleting substances (refrigeration and air conditioning) and 2.G other product manufacture and use (use of electrical equipment). F-gas emissions were estimated using default EFs from the 2019 Refinement to the 2006 IPCC Guidelines. Tunisia noted in its BUR improvements in its reporting of emission estimates for the IPPU sector, namely an update to the time series of AD for mineral production to reflect, inter alia, new production sites and the new country-specific EF.

46. The TTE noted that Tunisia reported on HFCs but only in an aggregated manner under subcategory 2.F.1.a (refrigeration and stationary air conditioning) and reported on SF₆ for

subcategory 2.G.1.b (use of electrical equipment) only, without including other possible emissions sources in the country, such as subcategories 2.F.1.b (mobile air conditioning), 2.G.3 (N₂O from product uses) and 2.H.2 (food and beverages industry). During the technical analysis, Tunisia clarified that all HFC emissions were reported under subcategory 2.F.1 regardless of subsector because the method is based on quantities imported; it lacks disaggregated data on F-gases and data on the non-reported sources; and a specific investigation would be needed to collect data for future submissions. Tunisia did not report on PFC emissions but clarified during the technical analysis that PFCs are not used in Tunisia, or only in insignificant quantities, and that it plans to conduct a survey to identify any uses of these products for future inventories. Tunisia clarified in its BUR that it plans to improve data collection for each activity in the sector and to use the collected data for estimating emissions for future submissions.

47. The tier 2 and tier 3 methodologies used for deriving the EFs for Tunisia's mineral industry, specifically the EFs for clinker production and nitric acid emissions, were not clearly described or documented in the BUR. The BUR (p.93) states that information on quantities of carbonates used for clinker production from the 2006 IPCC Guidelines was used to produce the country-specific EF reported in BUR table 33. Only one plant produces nitric acid, and the associated emissions were estimated using a plant-specific EF for N₂O and an equation from the 2006 IPCC Guidelines. Tunisia did not report on the measurements made at the plant or the methodology for deriving the plant-specific EF but clarified in the BUR that the EF is confidential.

48. For 2006 IPCC Guidelines AFOLU categories 3.A and 3.C, CH₄ emissions from enteric fermentation, CO₂ emissions from biomass burning, and direct and indirect N₂O emissions from managed soils were identified as key categories and the most relevant emissions sources in the sector. Categories 3.A and 3.C account for 27 and 25 per cent of AFOLU sector emissions respectively. The Party reported that 85 per cent of livestock emissions were from enteric fermentation, and the rest were from manure management. Category 3.C was dominated by N₂O emissions from managed soils and CO₂ emissions biomass burning, mainly forest fires, with the area burned peaking at approximately 25,000 ha in 2021. The estimates for managed soils were based on fertilizer-use data maintained by the Ministry of Agriculture, Water Resources and Fisheries, while the estimates for biomass burning were based on annual data on burned areas compiled by the General Directorate of Forests.

49. For land and HWP (categories 3.B and 3.D), Tunisia reported annual GHG emissions and removals for 2010–2021. Overall, the net removals from land (category 3.B) fluctuated between a minimum of 10,428.25 Gg CO₂ eq in 2010 and a maximum of 13,430.89 Gg CO₂ eq in 2021, and the net emissions from HWP (category 3.D) fluctuated between a minimum of 2,726.56 Gg CO₂ eq in 2021 and a maximum of 3,607 Gg CO₂ eq in 2018. In the absence of data on the consumption of wood biomass for energy use after 1997, Tunisia estimated the annual consumption of wood biomass for 1998–2021 using an Excel-based extrapolation model (as described in BUR section 3.4.8, p.127). It used these estimates to calculate CO₂ emissions from wood extraction and use, which it reported under 2006 IPCC Guidelines category 3.D.1 (HWP). The Party reported CO₂ emissions from biomass combustion in the AFOLU sector in line with the 2006 IPCC Guidelines. The Party mentioned in the BUR (p.127) that it needs to improve the EFs and AD used in estimating emissions for category 3.D; specifically, it needs to adjust the hypotheses for biomass consumption trends given the length of time since the base year (1997), which provided the basis for the extrapolation, and to determine the properties of the wood used, such as carbon content and humidity, to improve the accuracy of the EF.

50. Information on the AD and sources of AD for AFOLU categories 3.B.1 (forest land), 3.B.3 (grassland), 3.B.5 (settlements), 3.B.6 (other land) and 3.D.1 (HWP) and on CO₂ emissions for some of these subcategories was not reported in Tunisia's BUR. During the technical analysis, the Party explained that these data are spread across some 40–50 files, some of which contain large amounts of information. In addition, the Party explained that it is constrained by a lack of access to cartography data or spatial information for estimating emissions from land-use changes, which is why AD and emission estimates are missing for some AFOLU categories under category 3.B land.

51. The TTE noted that the BUR (p.123) specifies the AD for desertification (approximately 23,000 ha/year); however, it is not clear how this information was used or to which category the AD were assigned, given that no emissions were reported for subcategory 3.B.6.b (land converted to other land). The TTE noted that reporting this information in the BUR could facilitate a better understanding of the information reported.

52. For the waste sector, information was clearly reported on AD and their sources, including on the composition of waste, and methodological tier levels (the Party used a tier 2 methodology from the 2006 IPCC Guidelines and the IPCC waste model). All AD sources were reported for all subcategories. Tunisia made improvements in the information reported; specifically, it revised the time series for waste to reflect the population, the rate of waste generation and wastewater treatment practices.

53. Information on the methodology used for estimating CH₄ emissions under category 4.E (other) from storage of olive mill effluent (olive pomace oil known as “margines”), which is a by-product of the olive oil industry and a significant source of liquid waste, was not clearly reported in Tunisia’s BUR. During the technical analysis, Tunisia provided additional information, including an EF of 5.6 kg CH₄/m³ for margines stored in open-air basins. However, it was not clear whether this EF is based on direct measurements or estimated from the chemical oxygen demand content, and Tunisia did not provide scientific reports from the Centre of Biotechnology of Sfax, which developed this country-specific EF. The TTE also noted that margines storage could release other GHGs depending on atmospheric conditions, especially if the basin were assumed to be partially anaerobic owing to the high nitrogen content, and that only a portion of the margines was stored; the remainder was used in agriculture and the estimated emissions were reported under the agriculture sector. During the technical analysis, Tunisia provided information about nitrogen considerations and N₂O emissions from soil related to the use of margines in agriculture. Additionally, Tunisia indicated that further country-specific research is required by the Centre of Biotechnology of Sfax to explore additional emissions from agricultural use of margines.

54. The BUR provides an update to some of the GHG inventories reported in the Party’s previous NCs and BURs. The information reported provides an update of the Party’s NC3 and second BUR, which addresses anthropogenic emissions and removals for 2012. The update was carried out for 2010–2021 using the methodologies contained in the 2006 IPCC Guidelines, thus generating a consistent 12-year time series. The Party reported that it recalculated emissions for the energy, IPPU, AFOLU and waste sectors for 2010, 2011 and 2012 only owing to changes in AD and EFs. The Party reported that recalculations were performed using updated AD and EFs and reported the impact of the recalculations separately for each category, but the total impact of the recalculations was not reported.

55. Summary information of inventories for previous submission years (1994 and 2000), which was reported in Tunisia’s NC1 and NC2, was not reported in the Party’s BUR. During the technical analysis, the Party explained that this information was included in the second BUR and, as there were no changes in the results for those years, the inventory team did not think it necessary to report the information again.

56. Tunisia described in its BUR the institutional framework for the preparation of its 2021 GHG inventory. The Party reported that the Ministry of Environment is the governmental body responsible for its climate change policy and GHG inventory, which was prepared with the support of the United Nations Development Programme, which assisted Tunisia in designing its GHG inventory system.

57. Information on institutional arrangements and procedures for collecting and archiving data for the GHG inventory was not clearly reported in Tunisia’s BUR. During the technical analysis, the Party provided a document which clarifies that the inventory processes are overseen by an inventory coordination centre that coordinates the work of the Emissions Inventory Coordination Group, whose role is to ensure the smooth running of inventory operations; the Transversal Technical Coordination Team, responsible for selecting the global methods for the GHG inventory, compiling results and presenting the final inventory report; and groups of sectoral experts who propose detailed methods, collect and process data and draft the sections of the inventory report relevant to their sector. The Party further explained that it experienced constraints and challenges with regard to collecting, archiving

and managing inventory data, as well as constraints relating to improving the accuracy of AD and EFs needed to report on national GHG inventories.

58. Tunisia reported that it performed a key category analysis using approach 1 for the level of emissions and removals for 2020. The analysis identified CO₂ removals from cropland remaining cropland (subcategory 3.B.2.a) as the largest contributor to the level assessment, accounting for 17.6 per cent of the total absolute level of emissions and removals considered in the analysis (third BUR, table 72).

59. The BUR provides information on QA/QC measures for all sectors. The information reported includes a description of the QC process, which is implemented by the relevant organizations during the various phases of developing and updating the inventory. The checks, which may be automatic or manual, can take the form of checklists; plausibility, consistency and completeness tests; trend analyses; or simulations, for example. The information reported also covers QA methods and procedures, including in relation to organizing meetings of the sectoral experts with the aim of collecting their feedback on the assumptions made. The TTE commends Tunisia for reporting information in accordance with the IPCC good practice guidance.

60. Tunisia reported information on CO₂ fuel combustion emissions using both the sectoral and the reference approach. The information reported indicates that the combustion emissions estimated under the sectoral and the reference approach are 27,312.27 and 26,855.44 kt CO₂ respectively for 2021. The difference between the estimates calculated using the two approaches was reported as 456.83 kt CO₂ (1.7 per cent).

61. Information was clearly reported on international aviation and marine bunker fuels. The Party also reported improvements already made to its inventory estimation methods, including the development of a country-specific CO₂ EF for gasoil and the revision of the country-specific CO₂ EF for natural gas. In addition, the Party outlined planned improvements to the estimation and reporting of direct gases (CO₂, CH₄ and N₂O) and indirect gases (CO, NO_x, NMVOCs and SO₂) in its national inventory improvement plan.

62. Tunisia reported information on the uncertainty assessment (level) of its national GHG inventory. The uncertainty analysis was based on the tier 1 approach and covers almost all source categories and almost all direct GHGs. The results obtained, as reported in the BUR, reveal that the level uncertainty for emissions is 13.7 per cent and the trend uncertainty is 15.1 per cent.

63. Information on the underlying assumptions for calculating uncertainty was not reported in Tunisia's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that uncertainties for AD and EFs were either taken from the 2006 IPCC Guidelines or estimated following judgment meetings among experts in charge of inventory compilation.

64. The TTE noted that the transparency of the information reported on GHG inventories could be further enhanced by addressing the areas noted in paragraphs 30, 32, 34, 37, 39, 40, 46, 50, 51, 53, 55, 57 and 63 above, which could facilitate a better understanding of the information reported on GHG inventories.

65. In paragraph 45 of the summary report on the technical analysis of the Party's second BUR, the previous TTE noted areas where the transparency of the reporting on GHG inventories could be enhanced, including with regard to an organizational framework for the GHG inventory, methodological documentation and an information system for the inventory. The current TTE noted the improvements referred to in paragraphs 43, 45, 52 and 61 above and commends the Party for enhancing the transparency of its reporting.

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

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

67. The information reported provides a clear overview of the Party's mitigation actions and their effects. In its BUR, Tunisia reported information on its national context and framed its national mitigation planning and actions in the context of its revised NDC, national 2050 low-carbon strategy and 2022–2030 national action plan. Most of the mitigation actions are in the energy sector, with energy efficiency being the main source of emission reductions.

68. The Party reported information on NDC targets, and mitigation actions to be implemented under the 2022–2030 national action plan, as well as progress in achieving such targets. Tunisia's updated NDC has the objective of reducing carbon intensity by 45 per cent by 2030 compared with the 2010 level. Under the low-carbon scenario of the updated NDC, net emissions are expected to be 31 Mt CO₂ eq for 2030, which is 11 per cent below net emissions in 2010. The mitigation actions planned under the updated NDC are expected to result in emission reductions amounting to at least 87 Mt CO₂ eq for 2022–2030 compared with the 'business as usual' scenario. The TTE acknowledged the information, which is presented in this summary report as contextual without assessing the completeness and transparency of the information.

69. The Party reported a summary of its mitigation actions in tabular format in accordance with decision 2/CP.17, annex III, paragraph 11, for seven ongoing actions (energy efficiency for the industrial, tertiary and transport sectors, and four actions on renewable energy). Another six mitigation actions in the energy sector and all actions in the IPPU, AFOLU and waste sectors are described only in narrative format.

70. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Tunisia reported the names of mitigation actions or groups of actions, coverage (sectors and gases), progress indicators and goals for all ongoing and planned mitigation actions in the energy sector (third BUR, pp.151–156). A description of mitigation actions, as well as information on quantitative goals, was provided in the BUR. For all sectors, Tunisia presented the mitigation actions implemented in 2010–2021 and the planned actions for 2022–2030 under the updated NDC. Four actions in the energy sector were described in more detail, namely the Alliance of Municipalities for Energy Transition, the Energy Transition in Public Institutions programme and the programme promoting access to solar PV installations for low- and middle-income households.

71. Only partial information on names of mitigation actions or groups of actions, coverage (gases), progress indicators and quantitative goals was reported for the IPPU, AFOLU and waste sectors. For instance, for the AFOLU sector, the Party only provided general information for completed mitigation actions rather than naming them individually, and although it reported names of individual planned AFOLU actions, the corresponding descriptions and quantitative goals were reported in an aggregated manner. For implemented mitigation actions in the waste sector, Tunisia provided a narrative description of programmes and actions in an aggregated manner under two categories, solid waste and sanitation, without clearly stating the name of each individual action. In the BUR Tunisia identified the lack of progress indicators for solid waste as a constraint. During the technical analysis, the Party clarified that auditing results are aggregated in terms of emission reductions by fuel type across all programme contracts in each relevant sector (industrial processes, tertiary and transport).

72. Tunisia clearly reported information on the objectives and progress of implementation of all actions or groups of actions, as well as information on methodologies and assumptions, for seven key actions in the energy sector (implemented between 2010 and 2021) in annex 7 to the BUR. Information on methodologies for the actions in the waste sector and assumptions for the first group of actions in the AFOLU sector was also reported. Information on steps taken or envisaged to achieve actions and on progress of implementing them was also reported for the energy and waste sectors.

73. For the energy sector, the mitigation actions focus mainly on improving energy efficiency and promoting the use of renewable energy sources and were reported as implemented, ongoing or planned. The actions for renewable energy mainly concern access to energy for all. Information on quantitative goals was reported in terms of GHG reductions and installed capacity (in MW) for all renewable energy actions. From 2010 to 2021, total installed capacity for grid-connected PV installations reached 194 MW, resulting in an

estimated emission reduction of 566 kt CO₂ eq. The Tunisian Government has also approved the implementation of 57 additional PV projects, totalling 273 MW, within existing structures, and a separate prequalification tender awarded concessions for five other projects totalling 500 MW in 2019. Implementation of these projects is currently under way. The target is to achieve a total of 3,050 MW additional PV capacity between 2022 and 2030. For wind projects, authorized and planned installations amount to 120 and 300 MW capacity respectively, while the target for 2030 is a total of 1,385 MW additional capacity. Another renewables action relates to off-grid PV installations, with a total capacity for 2010–2021 of 4 MW for solar pumping, 300 kW for rural electrification and 200 kW for public lighting. Finally, solar water heaters providing 800,000 m² collector surface area have been installed via the Prosol programme, and the 2030 target is to achieve an additional 987,000 m².

74. The energy efficiency actions encompass the industrial, tertiary and residential sectors. The actions promote the adoption of eco-energy technologies and energy-saving measures identified after conducting energy audits or specific studies. The actions have resulted in significant energy savings for the industrial, tertiary and residential sectors (1,444, 108 and 66 ktoe respectively in 2010–2021) and avoided GHG emissions (3,470, 260 and 205 kt CO₂ eq respectively for the industrial, tertiary and residential sectors for the same period). The actions are characterized by a dual regulatory and incentive approach. Tunisia's energy management action plan for 2022–2030 outlines key actions, including the consolidation of existing institutional programmes, widespread adoption of the International Organization for Standardization 50001 standard and energy management systems across the industrial, tertiary and transport sectors, and promotion of eco-construction and efficient lighting and appliances, as well as advocacy of sustainable transportation and electric vehicles. The implementation of the action plan requires a total investment of some USD 4.8 billion and is expected to prevent approximately 40 Mt CO₂ eq emissions.

75. For the IPPU sector, the mitigation actions focus mainly on reducing emissions from the cement sector and reducing N₂O emissions from a nitric acid factory and HFC emissions. HFC emissions are a notable component of emissions attributable to the IPPU sector. The country ratified the Kigali Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer in March 2021, initiating a strategy for gradually reducing HFCs. The Party's reduction efforts include launching an information system for monitoring imports, adopting regulatory measures and implementing capacity-building and certification programmes for technicians working in the refrigeration sector. The cumulative reduction in HFC emissions is projected to be approximately 4.6 Mt CO₂ eq over 2022–2030. Most mitigation actions in the IPPU sector were reported as recently initiated or planned. Collectively, the actions targeting cement production, nitric acid production and HFCs are expected to deliver an annual emission reduction of approximately 1.1 Mt CO₂ eq in 2030 and a cumulative reduction of approximately 8 Mt CO₂ eq over 2022–2030.

76. For the AFOLU sector, Tunisia reported that although it does not have specific sectoral mitigation actions, its strategy on agriculture, forestry and natural resource management is in line with the aim of mitigating GHG emissions. Tunisia reported aggregated information on past mitigation actions in the sector and annual results achieved (in ha) for 2010–2021 for reforestation, olives and arboriculture plantation, pastoral plantations and fire management. Over that period, Tunisia reported 46,100 ha of reforestation, 13,600 ha of pastoral plantations and 110,500 ha of windbreak and alignment plantations, amounting to a combined area of 170,300 ha. Tree cultivation, mainly of olive trees, continued to increase during that period, from 180 million to 204 million trees. For its action plan for 2022–2030, which is in line with its updated NDC, Tunisia reported 20 actions grouped into five categories, namely integrated actions for land and ecosystem restoration/preservation, optimization of agricultural production and input management methods, protection of forest ecosystems against widespread forest fires, energy recovery from agricultural waste and reduction of waste in the food/agricultural commodities sector. These actions are expected to result in a cumulative emission reduction of 5,164.2 kt CO₂ eq and removals of 5,800.1 kt CO₂ eq between 2021 and 2030.

77. For the waste sector, the mitigation actions are divided into two categories: solid waste and sanitation (wastewater treatment). Regarding solid waste, Tunisia provided a description and information on the objectives of its national waste management programme and its

integrated and sustainable national strategy for waste, including the details of two CDM projects on managing 10 landfill sites, which resulted in eight sites being equipped with gas extraction systems, some of which are still operational and some of which have been shut down. CH₄ flaring projects at landfill sites resulted in emission reductions amounting to 1.8 Mt CO₂ eq in 2010–2021. With regard to sanitation, Tunisia highlighted the technical challenges associated with its biogas projects and noted that only one wastewater treatment plant is currently used for biogas production and electricity generation. Regarding its action plan for 2022–2030, Tunisia plans to promote waste minimization, enhance recycling and waste management and maintain existing gas extraction systems where energy recovery takes place. The actions identified include extending municipal waste management to other towns in the country and improving gas extraction systems to recover CH₄ for energy purposes. The actions related to solid waste and sanitation are expected to result in cumulative emission reductions of 5,011 and 448 kt CO₂ eq respectively between 2022 and 2030.

78. Information on methodologies for the actions in the IPPU and AFOLU sectors and the assumptions used for the IPPU and waste sectors and most of the AFOLU sector actions was not reported in Tunisia's BUR. The BUR does not refer to the methodologies and assumptions reported for NAMAs in the second BUR. Information was not reported on steps taken or envisaged to achieve the actions and on their progress of implementation in the IPPU and AFOLU sectors, and the information reported for some of the NAMAs has not been updated since the second BUR. During the technical analysis, the Party clarified that comprehensively reporting on the assumptions for each action is challenging given the time constraints. Some of this work was carried out using various tools and models, including the MEDPro techno-economic model for medium- and long-term energy-demand forecasting and simulation, and Excel simulations, but the detailed information obtained was not reproduced in the BUR in order to keep it an acceptable length. The Party also clarified that the absence of an established MRV system and limitations in terms of human and material resources made it challenging to track and report on implemented actions. The Party also clarified that some of the NAMAs are still under preparation owing to a lack of available financing and it is not possible to estimate when they will be implemented. Tunisia also mentioned that detailed sectoral action plans are currently under preparation to enable the implementation of all the mitigation actions identified in the BUR.

79. Tunisia provided information on its involvement in international market mechanisms as a Party to the Kyoto Protocol. It documented two registered landfill gas projects under the UNFCCC CDM process (see para. 77 above), with CERs issued from 2008 to 2016.

80. Tunisia did not report on any other CDM projects, including those mentioned in its second BUR, and the reason for this was not clear to the TTE. During the technical analysis, the Party provided a document containing information on all CDM projects, stating that 11 have been developed in Tunisia and the registration process has only been completed by the CDM Executive Board for seven projects. Only four projects (the two projects on landfills, one project on wind energy and another in residential solar) were able to generate CERs.

81. Tunisia reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that a formal MRV system for mitigation actions only exists in the energy sector and a comprehensive MRV system has been developed for the cement subsector; however, upstream data-collection systems exist for the other sectors, and those systems could be used to build a centralized MRV system. Tunisia has conducted a study on designing and implementing a centralized national transparency system, which is expected to be available online. According to the BUR, one of its components, the National System for Monitoring and Evaluating Mitigation Measures, will be based on, inter alia, the existing MRV systems for the energy and cement sectors. An MRV system for the waste sector has been designed, while an MRV system for the AFOLU sector will need to be designed from scratch. From 2024 onward, the MRV system for mitigation actions will include a module that produces the common reporting format tables. Regarding institutional arrangements, a technical advisory committee on mitigation, composed of representatives of various institutions and ministries, will oversee activities under the National System for Monitoring and Evaluating Mitigation Measures. UGPO will be the secretariat for the MRV system for mitigation actions and a technical mitigation office will be responsible for coordinating all mitigation actions and

ensuring their coherence. Tunisia reported capacity-building needs relating to the operationalization of this MRV system for mitigation actions.

82. The TTE noted that the transparency of the information reported on mitigation actions could be enhanced by addressing the areas noted in paragraphs 71, 78 and 80 above, which could facilitate a better understanding of the information reported on mitigation actions.

83. Tunisia reported in its BUR (sections 1.6 and 2.2) information on its current initiatives for enhancing its existing MRV system for compliance with requirements under the ETF. The Party reported in its BUR a pre-filled version of the common tabular format tables for tracking the NDC for the energy sector for 2021. It also reported that the technical advisory committee on mitigation will monitor and supervise work related to reporting on mitigation for the biennial transparency report, and the validation and approval of the report, for submission to the secretariat. The TTE commends the Party for 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

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

85. Tunisia 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, Tunisia identified its dependence on imported energy and consequential energy imbalance owing to lack of access to alternative energy as constraints. Other constraints related to reporting mainly pertain to data collection, accessing and tracking certain sectoral information, and accessing financial resources for implementing programmes. Tunisia reported that its financial, technical and capacity-building needs are primarily in the areas of tracking the progress of implementation of its mitigation actions, tracking support received and using the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines for preparing its GHG inventory and implementing its NDC. The financial needs for capacity-building and for implementation of the mitigation actions reported in the updated NDC amount to USD 744 million and USD 14.4 billion respectively by 2030.

86. Tunisia reported information on financial resources received in accordance with decision 2/CP.17, annex III, paragraph 15. In its BUR, Tunisia reported that it received USD 388 million from bilateral and multilateral cooperation programmes for mitigation actions in the energy sector between 2010 and 2021. The information reported indicates that Tunisia also received financial support from the United Nations Development Programme to facilitate its use of the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines for preparing its GHG inventory.

87. Information on financial resources 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 for all sectors other than the energy sector, and on financial resources received for the preparation of the third BUR was not reported in Tunisia's BUR. In addition, information on technology development and transfer, technical and capacity-building support received was not clearly reported in the BUR. Tunisia provided in its BUR (p.202) a list of areas where both capacity-building and technology transfer support were received but did not provide details of the support received. Furthermore, the reporting did not clearly specify whether areas received capacity-building support, technology transfer support or both. Tunisia clarified in the BUR that, owing to the lack of systematic monitoring for support received, it was only able to report on financial support received for the energy sector. During the technical analysis, the Party also clarified that disaggregated information on capacity-building, technology development and transfer and technical support received was not reported owing to difficulties accessing good-quality data and capacity constraints in relation to identifying, collecting and analysing the required information.

88. Information on nationally determined technology needs was not reported in Tunisia's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party

clarified that a study entitled “The role of HFCs, cities and technological developments in GHG mitigation policy in Tunisia” was carried out with the support of the German Agency for International Cooperation in 2021. The study identified the most relevant needs for Tunisia in terms of technological innovation, and this information could have been incorporated in the BUR. However, the Party explained that owing to time constraints, it was not able to hold a wider stakeholder consultation on the findings, so the information was not included in the BUR.

89. The TTE noted that the transparency of the information reported on needs and support received could be enhanced by addressing the areas noted in paragraphs 87–888788 above, which could facilitate a better understanding of the information reported on needs and support received.

90. Tunisia reported in its BUR (section 2.2) information on its current initiative for enhancing its existing MRV system for compliance with requirements under the ETF. The initiative involves implementing an upgraded MRV system that includes a dedicated module for collecting and reporting information on support needed and received, and developing a global platform that will incorporate all existing sectoral MRV systems. This system will be developed in two phases: the first involves creating common tabular format tables in the form of an Excel workbook, and the second focuses on developing a web-based application. The system will be integrated into a central digital system for MRV, which will ultimately facilitate reporting under the ETF. The TTE commends the Party for the clear and comprehensive reporting on its proactive approach to preparing for ETF implementation.

D. Identification of capacity-building needs

91. In consultation with Tunisia, the TTE identified the following needs for capacity-building that could facilitate the preparation of subsequent BURs and participation in ICA, as well as the transition to the ETF:

- (a) Strengthening national capacity to develop and implement a national inventory system, including data management processes, a QA/QC plan and archiving systems for GHG inventory reporting;
- (b) Enhancing national capacity to estimate GHG emissions by moving to tier 2 and tier 3 methodologies in line with the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines;
- (c) Strengthening national capacity to select EFs and use appropriate methodologies from CORINAIR and the *EMEP/EEA air pollutant emission inventory guidebook 2013* for estimating indirect GHG emissions for all sectors;
- (d) Enhancing national capacity to collect data, estimate emissions and report information in relation to domestic navigation;
- (e) Enhancing national capacity for using COPERT for estimating emissions from road transportation using a higher-tier methodology (tier 2 and tier 3) considering the context of Tunisia (vehicle ageing, average mileage, emission standards, and so on);
- (f) Enhancing national capacity to estimate emissions and report on F-gas and N₂O emissions from all sources where such emissions occur;
- (g) Enhancing national capacity to report notation keys in line with the UNFCCC reporting guidelines on BURs;
- (h) Enhancing national capacity to estimate uncertainties, including by improving understanding of the underlying assumptions used in estimations;
- (i) Strengthening national capacity to report comparable information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF;
- (j) Enhancing national capacity to improve the AD and EFs used for the AFOLU sector (e.g. for subcategories 3.A.1, 3.B.2.a, 3.C.4 and 3.C.5) with a view to improving

emission estimates for the sector, including through capacity-building to enable the use of relevant tools;

(k) Enhancing national capacity to report clearly the names, coverage (gases), progress indicators and quantitative goals for each mitigation action;

(l) Enhancing national capacity to evaluate the strengths and weaknesses of international carbon market projects, especially with regard to identifying the sectoral project elements that target renewables, wastewater, solid waste, cogeneration, cement, chemicals, household appliances and transport, with a view to enhancing the Party's ability to determine how different policies address Article 6, paragraph 4, of the Paris Agreement, and informing the future functions of the designated national authority and the carbon market dimensions of the NDC;

(m) Strengthening national capacity to identify technology development needs and to track technology support received for addressing climate change related issues, in alignment with the nationally determined process;

(n) Strengthening national capacity to track support received for technology development and transfer, technical assistance and capacity-building support and report related information in a disaggregated, detailed manner.

92. The TTE noted that, in addition to those identified during the technical analysis, Tunisia reported several capacity-building needs in its BUR, which include capacity-building needs for future BURs and transitioning to the ETF, namely:

(a) Defining sectoral indicators and ensuring consistency with the database for UNFCCC reporting for the MRV system for mitigation actions;

(b) Developing GHG emissions scenarios, models and sectoral policies for the waste sector;

(c) Implementing the updated NDC in the energy, IPPU, AFOLU and waste sectors;

(d) Identifying sectoral gaps and constraints and defining actions to improve the reporting methods associated with the MRV of GHG inventories;

(e) Identifying sectoral gaps and constraints, selecting indicators and gathering data for monitoring in relation to the MRV of mitigation actions;

(f) Addressing cross-cutting issues related to key category analysis, uncertainties, content of reports, inventory cycles and QA/QC for the MRV of GHG inventories and mitigation actions;

(g) Coordinating and managing the MRV tools and databases;

(h) Reporting to the secretariat and under the international review process, as well as increasing the participation of Tunisian experts at international reviews;

(i) Developing the manual of procedures, including the digital platform for the MRV of support needed and received;

(j) Implementing mitigation programmes in the updated NDC for all sectors (energy, IPPU, AFOLU and waste).

93. In paragraph 65 of the summary report on the technical analysis of Tunisia's second BUR, the previous TTE, in consultation with Tunisia, identified capacity-building needs. The TTE noted that all of those capacity-building needs are still relevant.

III. Conclusions

94. The TTE conducted a technical analysis of the information reported in the third BUR of Tunisia 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; 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; and domestic MRV. During the technical analysis, additional information was provided by Tunisia on the notation keys used for the AFOLU sector and the challenges it faces in reporting, as well as more disaggregated information on GHG emissions and more detail on the methodologies and assumptions related to mitigation actions. The TTE concludes that the information analysed is partially transparent.

95. Tunisia reported an update on the institutional arrangements relevant to the preparation of its BURs. Tunisia has implemented several measures to enforce the institutional framework and improve climate governance, including by establishing UGPO, which has two consultative committees (on adaptation and mitigation) and a unit for partnerships and resource implementation, under the Ministry of Environment in 2018. The Party has also set up a working group in charge of GHG inventories under the supervision of ANME, with three subsectoral groups (energy and industrial processes; AFOLU; and solid waste and sanitation). An MRV system with two operational components (on GHG mitigation) is in place. This system is being upgraded and improved, particularly the component on support needed and received (not yet operational).

96. In its third BUR, submitted in 2022, Tunisia reported information on its national GHG inventory for 2010–2021. This included GHG emissions and removals of CO₂, CH₄ and N₂O for almost all relevant sources and sinks as well as the precursor gases. The inventory was developed on the basis of the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines. The total GHG emissions for 2021 were reported as 46,070.07 Gg CO₂ eq (excluding AFOLU categories 3.B and 3.D.1) and 35,365.74 Gg CO₂ eq (including AFOLU categories 3.B and 3.D.1). Key categories and main gases were identified as CO₂ emissions for subcategories 3.B.2.a cropland remaining cropland, 1.A.1.a electricity and heat production, 1.A.3.b road transportation, 2.A.1 cement production and 1.A.2.f non-metallic minerals. Estimates of F-gases were provided in an aggregated manner under subcategory 2.F.1 (refrigeration and air conditioning) owing to a lack of data for each subcategory, as clarified by the Party during the technical analysis.

97. Tunisia reported information on mitigation actions and their effects in both tabular and narrative format, including emission reduction targets and the baseline and mitigation scenarios for 2010–2030, and framed its national mitigation planning and actions in the context of its revised NDC, national 2050 low-carbon strategy and 2022–2030 national action plan. Tunisia included information on all mitigation actions in the energy, IPPU, AFOLU and waste sectors for 2010–2021, and its action plan for 2022–2030. The mitigation actions focus mainly on energy efficiency and renewable energy, reducing emissions from the cement sector and reducing N₂O and HFC emissions, as well as on reforestation and tree cultivation, land and ecosystem restoration, optimization of agricultural production and waste management. The Party reported the progress of implementation of its mitigation actions and the results achieved for each action or group of actions. Tunisia reported that if the mitigation actions under its updated NDC are implemented, the cumulative GHG emission reductions achieved will be at least 87 Mt CO₂ eq for 2022–2030. The Party also reported information on its involvement in international market mechanisms and on MRV arrangements. Information on names of mitigation actions, coverage (gases), progress indicators, quantitative goals, methodologies and assumptions and steps taken or envisaged to achieve the actions was reported only partially or at an aggregated level for the IPPU, AFOLU and waste sectors, mainly owing to time and resource constraints.

98. Tunisia reported information on key constraints, gaps and related needs, including difficulties in accessing data and information. Information was reported on the financial support received from various bilateral and multilateral sources for implementing mitigation actions in the energy sector, which totalled USD 388 million between 2010 and 2021. Information on technical, technology development and transfer, and capacity-building support received was not reported owing to difficulties in accessing disaggregated data, as clarified by the Party during the technical analysis. Moreover, the Party did not report information on nationally determined technology needs, but it clarified during the technical

analysis that it has carried out a study aimed at identifying the most relevant needs for Tunisia in terms of technological innovation, although the findings from that study were not incorporated in the BUR owing to time constraints.

99. The current TTE noted improvements in the reporting in the Party's third BUR compared with that in its previous BUR. The information reported demonstrates that the Party has taken into consideration some of 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.

100. The TTE, in consultation with Tunisia, identified the 14 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, as well as the transition to the ETF. Tunisia prioritized all the capacity-building needs referred to in paragraph 91 above.

Annex I

Extent of the information reported by Tunisia 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 Tunisia

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 2/CP.17, paragraph 41(g)	The first BUR shall cover, at a minimum, the inventory for the calendar year no more than four years prior to the date of the submission, or more recent years if information is available, and subsequent BURs shall cover a calendar year that does not precede the submission date by more than four years.	Yes	Tunisia submitted its third BUR in December 2022; the GHG inventory reported is for 2010–2021.
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	Tunisia used the 2006 IPCC Guidelines and the 2019 Refinement to 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.	Partly	Information on specific changes to AD for all sectors and on AD on land-use changes (category 3.B) was not provided, except for subcategory 3.B.2 cropland remaining cropland.
Decision 2/CP.17, annex III, paragraph 6	Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the BUR:		
	(a) The tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF;	No	Comparable information was not reported (such as the annual changes in carbon stocks in living biomass, dead organic matter and soils, and on the stratification of all land-use categories).
	(b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines.	Yes	Comparable information was reported.
Decision 2/CP.17, annex III, paragraph 7	Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in its previous NCs.	Partly	The time series reported in the BUR does not include 1994 and 2000, which were reported in Tunisia's NC1 and NC2 respectively.
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	Partly	This information was not reported for 1994 and 2000, which were included in the NC1 and NC2 respectively.

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
	previous submission years (e.g. for 1994 and 2000).		
Decision 2/CP.17, annex III, paragraph 9	The inventory section of the BUR should consist of an NIR as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National greenhouse gas inventories), including:		
	(a) Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors);	Yes	Comparable information was reported in the tables contained in annex 6 to the BUR (pp.244–250).
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF ₆).	Yes	Comparable information was reported in the tables contained in annex 6 to the BUR (pp.244–250).
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex.	NA	
Decision 17/CP.8, annex, paragraph 12	Non-Annex I Parties are also encouraged, to the extent possible, to undertake any key source analysis as indicated in the IPCC good practice guidance to assist in developing inventories that better reflect their national circumstances.	Yes	
Decision 17/CP.8, annex, paragraph 13	Non-Annex I Parties are encouraged to describe procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories, as well as efforts to make this a continuous process, including information on the role of the institutions involved.	Partly	Information on procedures and arrangements for archiving data for the preparation of national GHG inventories, including on the role of the institutions involved, was not clearly reported.
Decision 17/CP.8, annex, paragraph 14	Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of:		
	(a) CO ₂ ;	Partly	Emissions were not estimated for some subcategories under the AFOLU sector (such as 3.B.5 settlements and 3.B.6 other lands).
	(b) CH ₄ ;	Partly	Emissions were not estimated for some categories under the energy sector (such as natural gas distribution, fugitive emissions from mobile and stationary sources) and the waste sector (industrial solid waste, hazardous waste, clinical waste and sewage sludge).
	(c) N ₂ O.	Partly	Emissions were not estimated for some categories under the IPPU sector (such as medical applications).

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:		
	(a) HFCs;	Partly	Emissions were estimated for refrigeration and stationary air conditioning only.
	(b) PFCs;	No	
	(c) SF ₆ .	Partly	Information on SF ₆ emissions was provided for use of electrical equipment only.
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 ₂ ;	Partly	Information on CO emissions was reported for the energy and waste sectors; emissions from the IPPU sector were not reported; and for the AFOLU sector, only information for 2021 was reported.
	(b) NO _x ;	Partly	Tunisia reported information on NO _x emissions for the energy and waste sectors only. IPPU emissions were not reported. The Party reported this information for the AFOLU sector for 2021 only and not for the time series.
	(c) NMVOCs.	Partly	Information on NMVOC emissions was reported for the energy and waste sectors, but not for the IPPU and AFOLU sectors.
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.	Partly	The Party reported on other gases, such as sulfur oxides, for the energy sector only.
Decision 17/CP.8, annex, paragraph 18	Non-Annex I Parties are encouraged, to the extent possible, and if disaggregated data are available, to estimate and report CO ₂ fuel combustion emissions using both the sectoral and the reference approach and to explain any large differences between the two approaches.	Yes	
Decision 17/CP.8, annex, paragraph 19	Non-Annex I Parties should, to the extent possible, and if disaggregated data are available, report emissions from international aviation and marine bunker fuels separately in their inventories:		
	(a) International aviation;	Yes	
	(b) Marine bunker fuels.	Yes	
Decision 17/CP.8, annex, paragraph 20	Non-Annex I Parties wishing to report on aggregated GHG emissions and removals expressed in CO ₂ eq should use the GWP	NA	The Party used the GWP provided in the AR4.

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 21	provided by the IPCC in its AR2 based on the effects of GHGs over a 100-year time-horizon.		
	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;	Partly	Tunisia used the 2006 IPCC Guidelines and the 2019 Refinement to the 2006 IPCC Guidelines. Tier 2 and tier 3 methodologies were used for some categories in the energy, IPPU and waste sectors; however, Tunisia did not report information on the tier methodology used for the AFOLU sector.
	(b) Explanation of the sources of EFs;	Partly	Tunisia reported sources of EFs for the energy, IPPU and waste sectors (i.e. country- or plant-specific measurements and data, the 2006 IPCC Guidelines, and the <i>EMEP/EEA air pollutant emission inventory guidebook 2013</i>) but did not report this information for the AFOLU sector.
	(c) Explanation of the sources of AD;	Partly	Tunisia reported energy AD sourced mainly from the national energy balance and energy operators; IPPU AD from industrial operators and national statistics; AFOLU AD from government statistics, forest and pastoral inventories, sectoral surveys and expert assumptions; and waste AD from national population statistics and data from waste, wastewater and agriculture authorities. Sources of AD were not described for AFOLU subcategories 3.B.3 grassland and 3.B.5 settlements.

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
	(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:		
	(i) Source and/or sink categories;	Yes	Tunisia reported a country-specific source of emissions (margines in the olive oil industry) in the waste sector.
	(ii) Methodologies;	No	Tunisia did not describe the methodology used to estimate emissions from margines.
	(iii) EFs;	No	No information was reported on the EF used for estimating CH ₄ emissions from margines.
	(iv) AD;	Yes	
	(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.	Partly	Notation keys were used for the energy sector only.
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;	No	
	(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 Tunisia

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 2/CP.17, annex III, paragraph 11	Non-Annex I Parties should provide information, in tabular format, on actions to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol.	Partly	Information on seven mitigation actions in the energy sector was reported in tabular format, while all other actions were described only in narrative format.
Decision 2/CP.17, annex III, paragraph 12	For each mitigation action or group of mitigation actions, including, as appropriate, those listed in document FCCC/AWGLCA/2011/INF.1, developing country Parties shall provide the following information, to the extent possible:		
	(a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indicators;	Partly	Information on names, coverage, progress indicators and quantitative goals was not reported for some actions in the IPPU, AFOLU and waste sectors. Planned AFOLU mitigation actions were not named individually.
	(b) Information on:		
	(i) Methodologies;	Partly	No methodologies were reported for the IPPU and AFOLU sectors.
	(ii) Assumptions;	Partly	Assumptions were not provided for mitigation actions in the IPPU and waste sectors or for most of the AFOLU sector actions.
	(c) Information on:		
	(i) Objectives of the action;	Yes	
	(ii) Steps taken or envisaged to achieve that action;	Partly	Relevant information was not reported in the IPPU and AFOLU sectors.
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Yes	
	(ii) Progress of implementation of the underlying steps taken or envisaged;	Partly	Relevant information was not reported for the IPPU and AFOLU sectors.
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Yes	
	(e) Information on international market mechanisms.	Yes	
Decision 2/CP.17, annex III, paragraph 13	Parties should provide information on domestic MRV arrangements.	Yes	

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

Table I.3

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

<i>Decision</i>	<i>Provision of the reporting requirements</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 2/CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on: (a) Constraints and gaps; (b) Related financial, technical and capacity-building needs.	Yes Yes	
Decision 2/CP.17, annex III, paragraph 15	Non-Annex I Parties should provide: (a) Information on financial resources, technology transfer and capacity-building 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; (b) Information on technical support received from the Global Environment Facility, Parties included in Annex II to the Convention and other developed country Parties, the Green Climate Fund and multilateral institutions for activities relating to climate change, including for the preparation of the current BUR.	Partly No	Information was not reported on financial support received for preparation of the current BUR.
Decision 2/CP.17, annex III, paragraph 16	With regard to the development and transfer of technology, non-Annex I Parties should provide information on: (a) Nationally determined technology needs; (b) Technology support received.	No No	

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

Annex II

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

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

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

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

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

IPCC. 2019. *2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories*. E Calvo Buendia, K Tanabe, A Kranjc, et al. (eds.). Geneva: IPCC. Available at <https://www.ipcc-nggip.iges.or.jp/public/2019rf/index.html>.

B. UNFCCC documents

First, second and third BURs of Tunisia. Available at <https://unfccc.int/BURs>.

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

Summary reports on the technical analysis of the first and second BURs of Tunisia, contained in documents FCCC/SBI/ICA/2015/TASR.1/TUN and FCCC/SBI/ICA/2017/TASR.2/TUN respectively. Available at <https://unfccc.int/ICA-reports>.

C. Other documents

EEA. 2013. *EMEP/EEA air pollutant emission inventory guidebook 2013: Technical guidance to prepare national emission inventories*. Available at <https://www.eea.europa.eu/publications/emep-eea-guidebook-2013>.
