



United Nations

FCCC/SBI/ICA/2022/TASR.4/LBN



Framework Convention on  
Climate Change

Distr.: General  
20 April 2023

English only

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## **Technical analysis of the fourth biennial update report of Lebanon submitted on 29 December 2021**

### **Summary report by the team of technical experts**

#### *Summary*

According to decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention, consistently with their capabilities and the level of support provided for reporting, were to submit their first biennial update report by December 2014. Further, paragraph 41(f) of that decision states that Parties not included in Annex I to the Convention shall submit a biennial update report every two years, either as a summary of parts of their national communication in the year in which the national communication is submitted or as a stand-alone update report. As mandated, the least developed country Parties and small island developing States may submit biennial update reports at their discretion. This summary report presents the results of the technical analysis of the fourth biennial update report of Lebanon, 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>
AD	activity data
AFOLU	agriculture, forestry and other land use
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BUR	biennial update report
CBIT	Capacity-building Initiative for Transparency
CGE	Consultative Group of Experts
CH <sub>4</sub>	methane
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
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
GEF	Global Environment Facility
GHG	greenhouse gas
HFC	hydrofluorocarbon
HWP	harvested wood products
ICA	international consultation and analysis
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	<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 <sub>2</sub> O	nitrous oxide
NA	not applicable
NC	national communication
NDC	nationally determined contribution
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
PARSIFAL	Prandtlplane ARchitecture for the Sustainable Improvement of Future AirpLanes
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
Revised 1996 IPCC Guidelines	<i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</i>
SF <sub>6</sub>	sulfur hexafluoride
TTE	team of technical experts
UNFCCC guidelines for the preparation of NCs from non-Annex I Parties	“Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention”
UNFCCC reporting guidelines on BURs	“UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention”

## 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. Lebanon submitted its third BUR on 13 October 2019, which was analysed by a TTE in the fifteenth round of technical analysis of BURs from non-Annex I Parties, conducted from 9 to 13 March 2020. After the publication of its summary report, Lebanon participated in the tenth workshop for the facilitative sharing of views, convened virtually on 14 June 2021.
5. This summary report presents the results of the technical analysis of the fourth BUR of Lebanon, 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, Lebanon submitted its fourth BUR on 29 December 2021 as a stand-alone update report. The submission was made within two years and two months from the submission of the third BUR.
7. A desk analysis of Lebanon's fourth BUR was conducted from 20 to 24 June 2022 and was undertaken by the following TTE, drawn from the UNFCCC roster of experts on the basis of the criteria defined in decision 20/CP.19, annex, paragraphs 2–6: Sorin Deaconu (Romania), Reza Fallah (Islamic Republic of Iran), Mostafa Hasaneen (member of the CGE from Egypt), Mahendra Kumar (former member of the CGE from the Marshall Islands), William L'Heudé (former member of the CGE from France), Rosemary Lopez (Cuba), Brittany Meighan (Belize), Hamza Merabet (Algeria), Glasha Obrekht (Canada), Anne Omambia (former member of the CGE from Kenya), Robert Pismo (Cameroon), Mauro Meirelles de Oliveira Santos (Brazil), Virginia Sena Cianci (member of the CGE from Uruguay) and Ching Tiong Tan (Malaysia). Sorin Deaconu and Mahendra Kumar were the co-leads. The technical analysis was coordinated by Luca Birigazzi, Jamie Howland, Keiichi Igarashi, Pedro Torres and Davor Vesligaj (secretariat).
8. 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 Lebanon engaged in consultation<sup>1</sup> on the identification of capacity-building needs for the preparation of BURs and participation in the ICA process. Following the technical analysis of Lebanon's fourth BUR, the TTE prepared and shared a draft summary report with Lebanon on 19 August 2022 for its review and comment. Lebanon, in turn, provided its feedback on the draft summary report on 4 April 2023.

<sup>1</sup> The consultation was conducted via videoconferencing.

9. The TTE finalized the summary report in consultation with the Party on 5 April 2023.

## **II. Technical analysis of the biennial update report**

### **A. Scope of the technical analysis**

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

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

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

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

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

### **B. Extent of the information reported**

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

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

14. The current TTE noted improvements in the reporting in Lebanon's fourth BUR compared with that in its previous BUR. Information on the GHG inventory, mitigation actions and their effects, and needs and support reported in the Party's fourth 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.

15. Regarding the areas for enhancing understanding of the extent of the information reported in the BUR noted by the previous TTE in the summary report on the technical analysis of the Party's previous BUR, Lebanon identified the areas that were not addressed in its current BUR owing to lack of data, including providing information on emissions from solvent use, steps envisaged for achieving the mitigation actions, progress of implementation and quantitative goals for a number of mitigation actions in the energy and agriculture sectors, and nationally determined technology needs, which are potentially areas for enhancing national capacity.

## C. Technical analysis of the information reported

16. The technical analysis referred to in paragraph 10(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 fourth BUR, Lebanon provided an update on its national circumstances, which were affected during preparation of the BUR in 2021 by unprecedented economic, financial, monetary and banking crises amid the coronavirus disease 2019 pandemic, including the resulting Government-imposed lockdowns that restricted economic activity. Lebanon's situation was further aggravated by its dependency on imports for most of its food and energy supplies. The cost of fuel in Lebanon has increased dramatically since 2018, which has resulted in significant changes in domestic, institutional and industrial patterns of fuel consumption for electricity and heat generation as well as transport. The Party also provided information on its population, economic and social profile, climate change education and awareness, governance and gender responsiveness to climate actions. Detailed sectoral information was provided in tabular and graphic as well as narrative format.

21. Lebanon reported in its fourth BUR information 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. The Ministry of Environment is the main institution responsible for coordinating the preparation of Lebanon's BURs with the financial support of the GEF in collaboration with the United Nations Development Programme. In addition, the Ministry of Environment chairs the interministerial NDC committee, established in 2017 to follow up on NDC implementation, including by updating NDC targets and assessing gaps and needs related to implementing sectoral and cross-cutting activities under the NDC.

22. Information on the extent to which the existing arrangements allow for the ongoing collection and management of cross-sectoral data for preparing the GHG inventory and national reports was not clearly reported in Lebanon's BUR. During the technical analysis, the Party clarified that a national system for automatic and continuous collection of data related to climate change is not yet operational. An attempt was made in 2015 to digitalize the exchange of information for the energy sector using the design of the Management Information System on Climate Action platform. However, the platform needs to be updated and further operationalized to facilitate exchange of data, including on financial flows, between ministries. Improvements to current institutional arrangements are planned as part of a CBIT project, such as establishing an MRV coordinating entity and a network of partners to enhance the role and engagement of ministries and agencies not only in preparing the GHG inventory but also in collecting data and information for preparing other sections of the BUR.

23. The TTE noted that the transparency of the information reported on institutional arrangements could be enhanced by addressing the areas noted in paragraph 22 above, which could facilitate a better understanding of the information reported on institutional arrangements.

24. Lebanon reported in its BUR that there is currently no single national entity responsible for tracking and reporting on climate change projects and related expenditure in the country. The Ministry of Environment has made efforts to identify and track climate change related activities and associated financing over the years, but the information available for estimating the overall support that Lebanon is receiving for climate action is limited. During the technical analysis, Lebanon indicated that its CBIT project was most recently submitted to the GEF in 2022, whereby an MRV coordinating entity will be established with the responsibility of developing a long-term strategy for transparency-related activities, which will be an important reference point for all stakeholders in planning their activities related to reporting, capacity-building and institutional arrangements. The coordinating entity will also be responsible for setting up a cross-cutting system for tracking GHG emissions, mitigation and adaptation actions, support needed and received, and capacity-building needs. Specifically, this will include tracking implementation of Lebanon's NDC, the quantifiable progress of climate policies in terms of emission reduction potential, and climate finance, as well as assisting partner agencies in identifying areas where support for mitigation and adaptation is needed.

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

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

26. Lebanon submitted its fourth BUR in 2021 and the GHG inventory reported is for 2018. The GHG inventory is consistent with the requirements for the reporting time frame.

27. GHG emissions and removals for the BUR covering the 1994–2018 inventories were estimated using mainly tier 1 methodology from the 2006 IPCC Guidelines. Tier 2 methods were used to estimate emissions from cement manufacturing, product uses as substitutes for ozone-depleting substances (F-gases), road transport (CH<sub>4</sub> and N<sub>2</sub>O), solid waste disposal on land and wastewater treatment and discharge (CH<sub>4</sub>). Tier 3 methods, including models and inventory measurement systems, were used for some land categories in the AFOLU sector.

28. Information on AD and EFs used and their sources was clearly reported in the BUR. Proxy data, interpolation, extrapolation and estimation based on expert judgment were used where measured data were unavailable.

29. Information on the Party's total GHG emissions by gas for 2018 is outlined in table 1 in Gg CO<sub>2</sub> eq as reported in the BUR (table 7). It shows an increase in emissions of 456.3 per cent including land and HWP since 1994 (5,260.73 Gg CO<sub>2</sub> eq).

Table 1  
Greenhouse gas emissions by gas of Lebanon for 2018

<i>Gas</i>	<i>GHG emissions (Gg) including land and HWP<sup>a</sup></i>	<i>% change 1994–2018</i>	<i>GHG emissions (Gg) excluding land and HWP<sup>a</sup></i>	<i>% change 1994–2018</i>
CO <sub>2</sub>	24 772.19	545.2	27 978.86	295.2
CH <sub>4</sub>	69.28	81.6	69.28	81.6
N <sub>2</sub> O	2.77	107.4	2.77	107.4
HFCs	1 821.17	NA	1 821.17	NA
PFCs	NO	NA	NO	NA
SF <sub>6</sub>	NO	NA	NO	NA
Other	NA	NA	NA	NA
<b>Total (in Gg CO<sub>2</sub> eq)</b>	<b>29 266.03</b>	<b>456.3</b>	<b>32 472.70</b>	<b>318.5</b>

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

30. Information on other emissions was clearly reported, including 273.86 Gg carbon monoxide, 141.66 Gg nitrogen oxides, 48.34 Gg non-methane volatile organic compounds and 50.97 Gg sulfur dioxide, estimated using tier 1 methodology from the *EMEP/EEA air pollutant emission inventory guidebook 2019* for all categories except for transport, for which tier 2 technology-specific methodology was used. The TTE noted improvements to the reporting on these gases in Lebanon's fourth BUR compared with that in the previous BUR.

31. Anthropogenic emissions of PFCs and SF<sub>6</sub> were reported as "NO" or "NE" in the BUR but the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that there is no industry in the country that emits PFC or SF<sub>6</sub> emissions. Once the national industrial census has been updated by the Ministry of Industry, the Party will be able to provide information on potential emissions of PFCs and SF<sub>6</sub>. The Party also clarified that it currently lacks capacity to survey the IPPU sector and thus to generate comprehensive data on all industrial processes in Lebanon.

32. Lebanon applied notation keys in tables where numerical data were not provided. The use of notation keys was consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties.

33. Lebanon reported comparable information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF and the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines.

34. The shares of emissions that different sectors contributed to the Party's total GHG emissions excluding land (category 3.B) and HWP and other emissions (category 3.D), as calculated by the TTE using information from the BUR, in 2018 are reflected in table 2.

Table 2

**Shares of greenhouse gas emissions by sector of Lebanon for 2018**

<i>Sector</i>	<i>GHG emissions (Gg CO<sub>2</sub> eq)</i>	<i>% share<sup>a</sup></i>	<i>% change 1994–2018</i>
Energy	26 701.27	82.2	327.3
IPPU	3 360.73	10.4	181.7
AFOLU	–2 299.64	NA	7.8
Livestock (category 3.A)	629.97	1.9	8.3
Land (category 3.B)	–3 194.40	NA	–1.4
Aggregate sources and non-CO <sub>2</sub> emissions sources on land (category 3.C)	277.06	0.9	67.6
HWP and other emissions (category 3.D)	–12.27	NA	NA
Waste	1 503.66	4.6	134.3

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

35. Lebanon reported information on its use of global warming potential values consistent with those provided by the IPCC in its AR5 based on the effects over a 100-year time-horizon of GHGs.

36. For the energy sector, information was clearly reported on methodological tier levels, AD and their sources, EFs, key categories and notation keys used, as well as other information specific to the sector. Energy industries and electricity generation from public thermal power plants contributed the largest share of the sectoral emissions (38.0 per cent), followed by transport (27.7 per cent) and manufacturing industries and construction (18.7 per cent). GHG emissions from the energy sector grew in 1994–2018 owing to the increase in consumption of all types of fuel. The Party mentioned in the BUR that tier 1 methodology was used for the calculations for the power-related categories because of the lack of a national energy balance and adequate information on the carbon content of imported fuel. Disaggregation of vehicles by technology, fuel and operating conditions allowed for the use of tier 2 methodology for estimating CH<sub>4</sub> and N<sub>2</sub>O emissions from the transport sector.

37. The Party reported that private generators are estimated to meet up to 45 per cent of the total electricity demand in the country. However, as explained in the BUR, information

on their number is not available and it was not clear to the TTE whether emissions from fuel consumption for private generators are included in the total sectoral emissions. During the technical analysis, the Party clarified that disaggregated data are currently not available at the national level to allow for more accurate reporting of those emissions. Since private generators are illegal in Lebanon, there are no official data on their number, geographical distribution or capacity, or on the number of users they serve or the amount of electricity they produce. They are installed and operated in industrial facilities, small retail outlets, commercial institutions, public buildings and residential buildings, but in the majority of cases they are used at the neighbourhood level to distribute electricity to users within a private network. Therefore, the estimation of gas and diesel oil consumption at a disaggregated level for this informal part of the sector is highly uncertain.

38. For the IPPU sector, information was clearly reported on methodological tier levels, AD and their sources, EFs, key categories and notation keys used, as well as other information specific to the sector. The Party reported cement production (category 2.A.1) as the most significant key category. Emissions were calculated for major sources, namely cement, lime and glass production, and the Party clearly identified sources from which emissions do not occur, such as chemical and metal industry. Emissions from IPPU have increased owing partly to the addition of emissions of F-gases, which were calculated for the first time for the fourth BUR.

39. Some subcategories of the IPPU sector, including solvent use (category 2.D.3), fire protection (category 2.F.3) and electrical equipment (category 2.G.1), were reported as “NE” for all gases and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that it lacks capacity to collect the diverse AD required to report emissions for these subcategories. The Party faces challenges in collecting AD on solvent use in particular as the subcategory covers a wide variety of applications. No national survey on the industries operating in Lebanon has been conducted and the GHG inventory team did not prioritize collecting such information for compiling the fourth BUR.

40. For 2006 IPCC Guidelines AFOLU categories 3.A and 3.C, enteric fermentation (CH<sub>4</sub>) was identified as a key category and the most relevant emissions source in the sector in 2018 (accounting for 418.99 Gg CO<sub>2</sub> eq). N<sub>2</sub>O emissions were estimated at 387.95 Gg CO<sub>2</sub> eq for 2018, the main categories being aggregate sources and non-CO<sub>2</sub> emissions sources on land (category 3.C), followed by manure management (category 3.A.2). Emissions from agriculture remained more or less stable throughout 1994–2018 with an average yearly increase of 1 per cent. Emissions from aggregate sources and non-CO<sub>2</sub> emissions sources on land (category 3.C) fluctuated the most in the sector owing to changes in the annual amount of biomass burning, as explained in the BUR. The TTE noted the Party’s plans to improve the compilation of data on manure management systems.

41. For land (category 3.B), Lebanon reported annual GHG emissions and removals for 1994–2018. Overall, the net removals from land decreased due to decreasing forest area. Lebanon used a national land-use classification method that aligns with the IPCC land-use categories. In 2018, the LULUCF sector was a net sink, with –3,194.40 Gg CO<sub>2</sub> eq attributable to cropland (–1,220.25 Gg CO<sub>2</sub> eq), forest land (–2,026.06 Gg CO<sub>2</sub> eq) and settlement (51.91 Gg CO<sub>2</sub> eq). Lebanon used a tier 3 approach to collecting information on land area and land-area change over time using remote sensing land-cover maps, which enabled generation of data on land-use changes such as forest, cropland and grassland conversion to settlements and the extent of burned areas in forest, cropland and grassland. The Party reported that multitemporal satellite images were used to map changes in land cover and land use.

42. Emissions from grassland and wetlands were not estimated in Lebanon’s BUR. However, the Party provided relevant clarification in the BUR, explaining that this was owing to lack of data. During the technical analysis, the Party indicated that it requires data on grassland surface area and the management systems in place (e.g. status of grazing) in order to report emissions or removals from grassland. The Party added that it lacks capacity to design and implement a mechanism for continuous spatial monitoring and assessment for land subcategories using satellite remote sensing technology, geographic information system data and data published in official reports.



43. For the waste sector, information was clearly reported on methodological tier levels, AD and their sources, EFs, key categories and notation keys used, as well as other information specific to the sector. Solid waste disposal sites (category 4.A) and wastewater treatment and discharge (category 4.D) were identified as the main source of emissions and a tier 2 approach based on the 2006 IPCC Guidelines was used to estimate emissions for 2018 and the recalculated time series since 1994. During the technical analysis, Lebanon explained that emissions from the waste sector increased by more than 50 per cent from 2015 to 2018 because of the waste crisis in the country, which manifested in an increase in open dumping and open burning of unsegregated waste, thus reducing proper treatment of organic waste. However, emissions decreased following the opening of the Bourj Hammoud and Costa Brava landfill sites, where sorted waste is disposed of in technically managed cells.

44. The BUR provides an update to all GHG inventories reported in the Party's previous NCs and BURs. The information reported provides an update of the Party's third BUR, which addresses anthropogenic emissions and removals for 1994–2015. The update was carried out for 1994–2015 using the methodologies contained in the 2006 IPCC Guidelines, thus generating a consistent 24-year time series. The Party reported that it recalculated emissions for a few subcategories in the transport sector for which fleet-related AD were updated for the time series 1994–2018; for the IPPU sector with new data related to F-gas emissions and use of nitrogen for medical purposes; and for the waste sector in relation to solid waste disposal sites. The recalculations resulted in a slight decrease in the estimated total emissions (by 0.39 per cent on average over the time series).

45. Lebanon described in its BUR the institutional framework for the preparation of its 2018 GHG inventory. The Party reported that the Ministry of Environment is the lead compiler of the GHG inventory. Ministries, including the Ministry of Energy and Water, the Ministry of Agriculture and the Ministry of Interior and Municipalities; research institutes, such as the Institute for Environment at the University of Balamand; and specialized national research centres, such as IPT Energy Center, provide AD and other parameters for preparing and verifying the GHG inventory. The inventory compilation team is supported by sectoral experts (for transport, forestry and other land use, and wastewater) recruited on an as-needed basis and external reviewers (for IPPU, waste and AFOLU). AD are collected from relevant institutions by the Climate Change Office under the Ministry of Environment on the basis of data-sharing requests. Consultations are conducted with key stakeholders and data holders during the process.

46. Lebanon clearly reported that a key category analysis was performed for the level of and trend in emissions using a tier 1 approach for all sectors with and without LULUCF. Key categories include CO<sub>2</sub> emissions from energy industries, road transport and manufacturing industries, which were identified as the first three key categories by level assessment in the 2018 inventory.

47. The BUR provides information on QA/QC measures for all sectors in relation to AD, EFs and parameters in accordance with the 2006 IPCC Guidelines. Using standardized documentation sheets has led to a significant improvement in tracking methodological changes, data sources, assumptions, necessary improvements and recalculations. The Party identified improvements in its reporting such as allocating clear QC roles and responsibilities, and applying general and category-specific QC measures and sectoral QA. QA of the GHG inventory was performed through external review. The TTE commends the Party for enhancing the transparency of the information reported.

48. Lebanon clearly reported information on CO<sub>2</sub> fuel combustion emissions using both the sectoral and the reference approach. The information reported indicates that the combustion emissions estimated under the sectoral and reference approach in 2018 are 26,452.46 and 26,839.31 Gg CO<sub>2</sub> eq respectively. The difference between the estimates calculated using the two approaches was reported as 1.46 per cent (386.85 Gg CO<sub>2</sub> eq).

49. Information was clearly reported on international aviation and marine bunker fuels. Emissions from international aviation amounted to 813.21 Gg CO<sub>2</sub> eq and those from international waterborne navigation equal 117.52 Gg CO<sub>2</sub> eq for 2018.

50. Lebanon reported information on the uncertainty assessment (level) of its national GHG inventory, which is an improvement compared with the previous BUR. The uncertainty

analysis was based on the tier 1 approach and covers all categories of emissions and removals reported in the 2018 national GHG inventory for CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O. The results obtained, as reported in the BUR, reveal that the overall level uncertainty for the 2018 inventory is 12 per cent and the trend uncertainty is 171 per cent. The TTE noted improvements in the reporting on the uncertainty assessment.

51. Information on the uncertainty analysis for emissions of HFCs was not reported in Lebanon's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that F-gas emissions were estimated using AD collected under the National Cooling Plan of the National Ozone Unit and worksheets designed and developed for this purpose. However, the worksheets are not compatible with the IPCC uncertainty model and, consequently, AD and uncertainty values could not be integrated into or transferred to that model. Since the GHG inventory uncertainty analysis was generated using the IPCC model, it did not include F-gas emissions.

52. The TTE noted that the transparency of the information reported on GHG inventories could be further enhanced by addressing the areas noted in paragraphs 31, 37, 39 and 51 above, which could facilitate a better understanding of the information reported on GHG inventories.

53. In paragraph 48 of the summary report on the technical analysis of the Party's third BUR, the previous TTE noted areas where the transparency of the reporting on GHG inventories could be further enhanced: information on nitrogen oxides, carbon monoxide and non-methane volatile organic compounds was not reported, nor was information on solvent use or the uncertainty assessment (level) of the national GHG inventory. The current TTE noted the improvements referred to in paragraphs 30 and 50 above and commends the Party for enhancing the transparency of its reporting.

54. Lebanon reported in its BUR (table 114) information on its current initiatives for enhancing its GHG inventory reporting for compliance with requirements under the ETF, including assessing the status of implementation of the reporting requirements for the national inventory report under the ETF. The TTE commends the Party for the clear and comprehensive reporting on its proactive approach to preparing for ETF implementation.

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

55. As indicated in table I.2, Lebanon 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.

56. The information reported provides a clear overview of the Party's mitigation actions and their effects. In its BUR, Lebanon reported information on its national context and framed its national mitigation planning and actions in the context of its NDC targets and low-emission development strategy, which is being prepared with the support of the United Nations Development Programme. Lebanon indicated in its BUR that it has set targets in its NDC, updated in 2020, to reduce its GHG emissions by 2030 by 15 per cent as an unconditional target and 30 per cent as a conditional target compared with a 'business as usual' scenario, with specific targets for increasing use of renewable energy and energy efficiency. Lebanon also indicated in its BUR that the low-emission development strategy was planned to be finalized by 2021. During the technical analysis, the Party informed the TTE that the adoption of the low-emission development strategy has been postponed owing to the country's economic situation and the ongoing generation of data for elaborating the strategy. Most of the mitigation actions are in the energy, transport, and forestry and other land use sectors, with further actions planned relating to solid waste management and wastewater treatment.

57. Lebanon reported in its BUR that it has no major national legislation that directly addresses climate change. However, according to the BUR, several key initiatives have been successful in integrating climate change issues, such as the National Water Sector Strategy, the Ministry of Agriculture Strategy and the Renewable Energy Outlook for Lebanon. These initiatives helped to inform the NDC update. During the technical analysis, the Party

indicated that the Ministry of Environment is planning to organize technical training sessions to disseminate information on mainstreaming climate change to stakeholders.

58. The Party reported a summary of its mitigation actions in tabular format in accordance with decision 2/CP.17, annex III, paragraph 11, for actions in the energy, transport, forestry and other land use, and waste sectors. However, the Party reported in its BUR that the list of mitigation actions reported in tabular format is not exhaustive, and further mitigation actions were reported in narrative format. Some of the actions reported in the agriculture and forestry and other land use sectors include elements related to adaptation.

59. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Lebanon clearly reported the names of mitigation actions or groups of actions. For most of the reported actions in the energy, transport, and forestry and other land use sectors detailed descriptions are provided with information on the nature of the action, coverage, quantitative goals and progress indicators.

60. Information on quantitative goals and progress indicators was not reported in Lebanon's BUR for the National Energy Efficiency and Renewable Energy Action financing mechanism or the de-risking instruments of the Decentralized Renewable Energy Law, or for some mitigation actions in the transport, agriculture, forestry and other land use, and waste sectors. Lebanon indicated in its BUR that this information was not reported owing to lack of relevant information. During the technical analysis, the Party recognized that a more systematic approach is required to reporting this information on a continuous basis.

61. The Party clearly reported information on methodologies and assumptions, the objectives of the actions and steps taken or envisaged to achieve them, the progress of implementation of actions and of the underlying steps taken or envisaged to achieve them, and the results achieved, such as estimated outcomes and estimated emission reductions, for most mitigation actions in the energy, transport, and forestry and other land use sectors.

62. The energy sector mitigation actions focus mainly on improving energy efficiency and promoting renewable energy sources, and were reported mostly as ongoing. The Party reported the results of implementing its mitigation actions in the energy sector as an estimated emission reduction of 615,663 t CO<sub>2</sub> eq per year from 2016 to 2018, although this is likely to have been underestimated owing to the lack of systematic reporting on all mitigation actions in the sector.

63. The transport sector mitigation actions focus mainly on promoting public transport solutions and providing financial incentives for the purchase of hybrid and electric vehicles, and were reported as ongoing or planned. In addition, the 2014 national transport policy is aimed at restructuring freight transport in the long term. The Party reported the results of implementing some of the sectoral mitigation actions. The Greater Beirut Public Transport Project is aimed at establishing a bus rapid transit system and will result in an estimated emission reduction of 204,394 t CO<sub>2</sub> eq per year over the 20 years of the project lifetime. The planned nationally appropriate mitigation action in Lebanon's private road transport sector, aimed at creating a car scrappage programme for replacing old conventional vehicles with newer more efficient vehicles using alternative fuel technologies, is estimated to deliver emission reductions of between 230,818 and 848,604 t CO<sub>2</sub> eq per year depending on the assumed share of replacement.

64. The agriculture sector mitigation actions focus mainly on pilot projects related to water pumping and irrigation using renewable energy. In its BUR, Lebanon indicated that most projects in this sector target adaptation with the aim of reducing impacts of climate change and improving the resilience and adaptive capacity of farming communities.

65. The forestry and other land use sector mitigation actions focus mainly on afforestation and reforestation projects and initiatives, including managing wildfire risk. In its BUR, Lebanon indicated that the methodology used for calculating the removals from this sector is in line with the 2006 IPCC Guidelines and the IPCC inventory software was used. The estimated results achieved from the implemented projects amount to removals of 4.33 Gg CO<sub>2</sub> eq in 2016–2018.

66. The waste sector mitigation actions focus mainly on solid waste management and wastewater collection and treatment. Lebanon's solid waste management strategy comprises

the Integrated Solid Waste Management Act of 2018, which introduced the ‘polluter pays’ principle, a road map for 2019–2030 to ensure effective implementation and establish financial instruments, and the solid waste management capacities project. Fifteen wastewater collection and treatment projects were implemented in 2016–2018 as well as other industry-specific projects.

67. Information on methodologies and assumptions and estimated outcomes was not reported for some actions in the energy and transport sectors (such as biomass briquetting, the National Energy Efficiency and Renewable Energy Action financing mechanism and the Revitalization of Public Transport in Greater Beirut and EuroMed Transport Rail Project) and for any actions in the agriculture and waste sectors. Information on the steps taken or envisaged to achieve the actions and the progress of implementation of those actions and of the underlying steps taken or envisaged to achieve them was not reported for any mitigation actions in the agriculture or waste sector. During the technical analysis, Lebanon clarified that this information cannot be provided owing to lack of disaggregated data and noted that it will make efforts to report such information in subsequent BURs. The Party further clarified that an analysis of capacity-building, financial and technology needs for implementing a detailed survey on waste management technologies and on manure management systems was not undertaken owing to time, budget and personnel limitations.

68. Lebanon provided information on its involvement in international market mechanisms as a Party to the Kyoto Protocol. It documented seven clean development mechanism projects approved by its designated national authority that have been submitted to the Executive Board of the clean development mechanism, six of which have been registered. Information provided on the registered projects includes title, registration date, parties involved, methodologies and estimated emission reductions.

69. Lebanon reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that Lebanon has no domestic MRV system for mitigation actions. The Party reported that identifying mitigation actions in tabular format supports the Ministry of Environment in reporting the progress of implementation of sectoral mitigation actions. The Party also reported that the lack of institutional arrangements with public entities hinders their involvement in, and the completeness and accuracy of, the mapping of mitigation actions. During the technical analysis, Lebanon indicated that the planned MRV coordinating entity will be tasked with tracking the progress of implementation of mitigation actions and their effects, including by developing progress indicators, quantifying emission reduction potential and building partner agencies’ capacity to use tools and methodologies for collecting necessary data.

70. The TTE noted that the transparency of the information reported on mitigation actions could be further enhanced by addressing the areas noted in paragraphs 60 and 67 above, which could facilitate a better understanding of the information reported on mitigation actions.

71. In paragraph 71 of the summary report on the technical analysis of Lebanon’s third BUR, the previous TTE noted areas where the transparency of the reporting on mitigation actions could be further enhanced, including providing information on all implemented, completed or planned mitigation actions and their effects in the energy and transport sectors and pursuing efforts to report such information for the agriculture and waste sectors. The current TTE noted the improvements in the reporting on measures in the agriculture and waste sectors referred to in paragraphs 64 and 66 above and commends the Party for enhancing the transparency of its reporting.

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

72. As indicated in table I.3, Lebanon 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.

73. Lebanon 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. Information on constraints and gaps was provided on a sectoral basis for all

sectors in the BUR (tables 115–120), including information on constraints on tracking and reporting climate finance flows (table 6) and coordinating climate action by non-State actors and aligning such action with the NDC (table 121). The gaps related to implementing sectoral climate policies identified in Lebanon's fourth BUR are mainly technical, policy-related, legal, regulatory and institutional and include lack of coordination between different ministries, stable regulatory frameworks and data for estimating the support that Lebanon is receiving for addressing climate change.

74. In addition, gaps and needs have been identified and compiled through previous rounds of technical analysis with a view to improving Lebanon's reporting (see table 113 of the BUR). Most of the listed needs remain valid, even though many of them have been addressed in the course of the preparation of Lebanon's four submitted BURs. However, given the iterative nature of reporting under the UNFCCC, improvements are ongoing, especially in the light of the newly adopted modalities, procedures and guidelines for reporting under the ETF, which Lebanon is planning to follow (see also para. 84 below).

75. Lebanon reported that its financial, technical and capacity-building needs relate to climate reporting, implementing climate action, engaging non-State actors to plan and implement climate-related activities and gender mainstreaming, among others.

76. Lebanon's financial and technical needs were presented in its fourth BUR by thematic area but capacity-building needs were not explicitly identified. During the technical analysis, the Party clarified that, owing to lack of disaggregated data, capacity-building needs were not reported separately but with technical, institutional and awareness-related needs. Lebanon indicated that it will make efforts to report capacity-building needs separately in subsequent BURs.

77. Lebanon reported information on financial resources, capacity-building and technical support received in accordance with decision 2/CP.17, annex III, paragraph 15. In its BUR, Lebanon reported that it received USD 852,000 from the GEF for preparing its third BUR and NC4, and a further USD 802,500 from the European Union, Germany, Spain and the United Nations Development Programme via the NDC Support Programme and for other renewable energy and energy efficiency projects.

78. Information on whether Lebanon received funds from the GEF for preparing its fourth BUR was not clearly reported. During the technical analysis, the Party clarified that it did not receive any such financial support. The fourth BUR was prepared in parallel with the third BUR and NC4 with a view to complying with the two-year timeline for submission of BURs.

79. Information on the support received by Lebanon for climate change related projects was reported in its fourth BUR (tables 108–112), but support received for capacity-building was not explicitly differentiated. During the technical analysis, the Party clarified that capacity-building activities and technical support components had not been explicitly mentioned owing to time, budget and personnel limitations and also the lack of a methodology for presenting capacity-building components. Lebanon was not able to dedicate resources to comprehensive disaggregation for identifying capacity-building activities or technical support received, especially with the lack of appropriate institutional arrangements for reporting such activities on a regular basis. Under the CBIT project, it is expected that the establishment of an MRV coordinating entity, a network of partners and a donor coordination mechanism will facilitate identifying, sharing and reporting information on this type of support received.

80. Information on technology transfer needs was not reported in the BUR. The Party clarified in the BUR that this was due to lack of data. During the technical analysis, the Party also clarified that it is planning to update its technology needs assessment for its NC4, which is due to be submitted in December 2022. However, owing to the budget, scope and time limitations associated with the NC4, the Party will not be in a position to undertake a complete technology needs assessment. Therefore, Lebanon still needs to build its capacity to nationally determine its technology needs, especially concerning those technologies adopted by the private sector. The Party further clarified that national consultations supported by international expertise are needed to ascertain how to report on technology support received, including in relation to selecting criteria for defining a project under technology

support, monetizing technology transfer, tracking progress of activities and institutional arrangements for reporting.

81. 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 76, 78, 79 and 80 above, which could facilitate a better understanding of the information reported on needs and support received.

#### **5. Any other information**

82. Lebanon reported some information on adaptation actions in agriculture and LULUCF (the Smart Adaptation of Forest Landscapes in Mountain Areas) and PARSIFAL projects that may lead to GHG emission reductions, without providing estimations of such reductions.

### **D. Identification of capacity-building needs**

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

(a) In relation to the national GHG inventory:

(i) Developing institutional arrangements at the national level in order to improve systematic collection of AD for the solvent use category in the IPPU sector, including an industrial census;

(ii) Strengthening national capacity to estimate F-gas emissions using higher-tier methodologies and associated uncertainties;

(iii) Strengthening national capacity to design and implement a mechanism for continuous spatial monitoring and assessment for land subcategories combined with using satellite remote sensing, geographic information system data and data published in official reports;

(b) In relation to mitigation actions and their effects:

(i) Enhancing national capacity to facilitate systematic collection of information from stakeholders to enable tracking the progress of implementation of mitigation actions in all sectors, complementing the planned work in this area supported by the GEF under CBIT;

(ii) Enhancing technical capacity in the short term to further improve collection, analysis and reporting of data on mitigation actions in the transport sector (specifically for microprojects implemented by the private sector and at the community level) and in the agriculture and waste sectors, building on best practices from the Greater Beirut Public Transport Project, the planned nationally appropriate mitigation action and the energy sector, as appropriate and in accordance with sector-specific needs;

(c) In relation to needs and support:

(i) Building national capacity to develop technology action plans and mobilize finance for deploying technologies on the market;

(ii) Enhancing the GHG inventory data-collection platform and its operationalization to facilitate data exchange between ministries, including on financial flows;

(iii) Strengthening national capacity to define, identify and report technology transfer and support received.

84. The TTE noted that, in addition to those identified during the technical analysis, Lebanon reported the following capacity-building needs in its BUR, which include capacity-building needs for future BURs and transitioning to implementing the ETF:

(a) Improving the quality and quantity of data collected on water management;

(b) Improving monitoring and reporting of sectoral mitigation action;

- (c) Collecting and reporting information on support received;
- (d) Harmonizing data from all sources to estimate climate impacts of groups of actions and to avoid double counting of overlapping mitigation actions (i.e. including all actions implemented by private and public stakeholders);
- (e) Strengthening the grid management capability of Lebanon's public electricity provider, EDL;
- (f) Developing and implementing a well-defined and institutionalized methodology for systematically identifying and quantifying technical, financial, technological, capacity-building and other needs;
- (g) Strengthening capacity of stakeholders to mainstream gender in climate change mitigation and adaptation.

85. In paragraphs 82–83 of the summary report on the technical analysis of Lebanon's third BUR, the previous TTE, in consultation with Lebanon, identified capacity-building needs. In its fourth BUR, Lebanon reflected that it is planning to address some of those capacity-building needs with the support provided under the CBIT project.

### III. Conclusions

86. The TTE conducted a technical analysis of the information reported in the fourth BUR of Lebanon in accordance with the UNFCCC reporting guidelines on BURs and concludes that the information reported is mostly consistent. It provides an overview of national circumstances and institutional arrangements relevant to the preparation of NCs on a continuous basis; the national inventory of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol, including a national inventory report; mitigation actions and their effects, including associated methodologies and assumptions; constraints and gaps, and related financial, technical and capacity-building needs, including a description of support needed and received; the level of support received to enable the preparation and submission of BURs; and domestic MRV. During the technical analysis, additional information was provided by Lebanon, clarifying aspects of its GHG inventory, mitigation actions, support received and domestic MRV. The TTE concluded that the information analysed is mostly transparent.

87. Lebanon reported an update on the institutional arrangements relevant to the preparation of its BURs, including the role of the Ministry of Environment and the planned establishment of an MRV coordinating entity responsible for setting up a cross-cutting system for tracking GHG emissions, mitigation and adaptation actions, support needed and received, and capacity-building needs. Specifically, this will include tracking NDC implementation, the quantifiable progress of climate policies in terms of emission reduction potential, and climate finance, as well as assisting partner agencies in identifying where support for mitigation and adaptation is needed.

88. In its fourth BUR, submitted in 2021, Lebanon reported information on its national GHG inventories for 1994–2018. This included GHG emissions and removals of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O and HFCs for all relevant sources and sinks as well as the precursor gases. The inventory was developed on the basis of the 2006 IPCC Guidelines using primarily tier 1 methodology. Higher-tier methods were used for some subcategories of the AFOLU, IPPU and energy sectors. The total GHG emissions for 2018 were reported as 32,472.70 Gg CO<sub>2</sub> eq (excluding land and HWP) and 29,266.03 Gg CO<sub>2</sub> eq (including land and HWP). Nine key categories and main gases were identified on the basis of the level assessment, including energy industries – liquid fuels (CO<sub>2</sub>) and road transport. Lebanon reported lack of data as the main reason for not reporting emissions for some categories and subcategories.

89. Lebanon reported information on mitigation actions and their effects in both tabular and narrative format in the context of its NDC targets and planned low-emission development strategy. Lebanon has set targets in its NDC, updated in 2020, to reduce its GHG emissions by 2030 by 15 per cent as an unconditional target and 30 per cent as a conditional target compared with a 'business as usual' scenario, with specific targets for increasing use of

renewable energy and energy efficiency. Lebanon reported planned, implemented and ongoing actions in the energy, transport, agriculture, forestry and other land use, and waste sectors. Most of the mitigation actions are in the energy, transport, and forestry and other land use sectors, though some projects have been, or will be, implemented in the agriculture and waste sectors. The mitigation actions focus on promoting energy efficiency, renewable energy and public transport solutions, providing financial incentives for the purchase of hybrid and electric vehicles, and afforestation and reforestation projects.

90. The Party reported the progress of implementation of most mitigation actions and the results achieved, including emission reductions or estimated outcomes for the energy, transport, and forestry and other land use sectors. The highest emission reduction was reported for the forestry and other land use sector of 4.33 Gg CO<sub>2</sub> eq between 2016 and 2018. Mitigation actions in the energy and transport sectors also contributed significantly to emission reductions. The Party also reported information on its involvement in international market mechanisms and on MRV arrangements. Estimates of emission reductions and information on methodologies and assumptions were not provided for some actions in the transport, agriculture and waste sectors owing to difficulties in obtaining the necessary data at a disaggregated level, as clarified by the Party in the BUR and during the technical analysis.

91. Lebanon reported information on key constraints, gaps and related needs, including the need to update and operationalize the data-collection platform for the GHG inventory to facilitate exchange of data, including on financial flows, between ministries; and the need for capacity-building to improve the development of technology action plans and mobilize further finance for deploying technologies on the market. Lebanon clearly reported on capacity-building support received. The Party also reported that it received USD 852,000 from the GEF for preparing its third BUR and NC4, which it also used for preparing its fourth BUR. Information on technology transfer was not reported owing to lack of data.

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

93. The TTE, in consultation with Lebanon, identified the eight capacity-building needs listed in chapter II.D above and needs for capacity-building that aim to facilitate reporting in accordance with the UNFCCC reporting guidelines on BURs and participation in ICA in accordance with the ICA modalities and guidelines, taking into account Article 4, paragraph 3, of the Convention. The Party, in consultation with the TTE, also identified needs for capacity-building to facilitate transition to the ETF as referred to in paragraph 84 above. Lebanon prioritized the capacity-building needs referred to in paragraph 83(b)(i-ii) and (c)(ii) above.



## Annex I

### Extent of the information reported by Lebanon in its fourth biennial update report

Table I.1

**Identification of the extent to which the elements of information on greenhouse gases are included in the fourth biennial update report of Lebanon**

<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	Lebanon submitted its fourth BUR in 2021; the GHG inventory reported is for 2018.
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	Lebanon used the 2006 IPCC Guidelines.
Decision 2/CP.17, annex III, paragraph 5	The updates of the section on national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol should contain updated data on activity levels based on the best information available using the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF; any change to the EF may be made in the subsequent full NC.	Yes	
Decision 2/CP.17, annex III, paragraph 6	Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the BUR:		
	(a) The tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF;	Yes	
	(b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines.	Yes	
Decision 2/CP.17, annex III, paragraph 7	Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in its previous NCs.	Yes	
Decision 2/CP.17, annex III, paragraph 8	Non-Annex I Parties that have previously reported on their national GHG inventories contained in their NCs are encouraged to submit summary information tables of inventories for previous submission years (e.g. for 1994 and 2000).	Yes	
Decision 2/CP.17, annex III, paragraph 9	The inventory section of the BUR should consist of a national inventory report as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National greenhouse gas inventories), including:	Yes	
	(a) Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not	Yes	

<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>
	controlled by the Montreal Protocol and greenhouse gas precursors);		
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF <sub>6</sub> ).	Yes	
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.	Yes	
Decision 17/CP.8, annex, paragraph 14	Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of:		
	(a) CO <sub>2</sub> ;	Partly	Emissions were not estimated for some IPPU and land categories.
	(b) CH <sub>4</sub> ;	Partly	Emissions were not estimated for some IPPU and land categories.
	(c) N <sub>2</sub> O.	Partly	Emissions were not estimated for some IPPU and land categories.
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:	Yes	
	(a) HFCs;	Yes	
	(b) PFCs;	Yes	
	(c) SF <sub>6</sub> .	Yes	.
Decision 17/CP.8, annex, paragraph 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emissions by sources of other GHGs, such as:		
	(a) Carbon monoxide;	Yes	
	(b) Nitrogen oxides;	Yes	
	(c) Non-methane volatile organic compounds.	Yes	
Decision 17/CP.8, annex, paragraph 17	Other gases not controlled by the Montreal Protocol, such as sulfur oxides, and included in the Revised 1996 IPCC Guidelines may be included at the discretion of Parties.	Yes	
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 <sub>2</sub> fuel combustion emissions using both the sectoral and the reference approach and to explain any large differences between the two approaches.	Yes	

<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 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: <ul style="list-style-type: none"> <li>(a) International aviation;</li> <li>(b) Marine bunker fuels.</li> </ul>	Yes Yes	
Decision 17/CP.8, annex, paragraph 20	Non-Annex I Parties wishing to report on aggregated GHG emissions and removals expressed in CO <sub>2</sub> eq should use the global warming potential provided by the IPCC in its AR2 based on the effects of GHGs over a 100-year time-horizon.	NA	The Party used the global warming potential provided in the AR5.
Decision 17/CP.8, annex, paragraph 21	Non-Annex I Parties are encouraged to provide information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol, including a brief explanation of the sources of EFs and AD. If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe the source and/or sink categories, methodologies, EFs and AD used in their estimation of emissions, as appropriate. Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building: <ul style="list-style-type: none"> <li>(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;</li> <li>(b) Explanation of the sources of EFs;</li> <li>(c) Explanation of the sources of AD;</li> <li>(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: <ul style="list-style-type: none"> <li>(i) Source and/or sink categories;</li> <li>(ii) Methodologies;</li> <li>(iii) EFs;</li> <li>(iv) AD;</li> </ul> </li> <li>(e) Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building.</li> </ul>	Yes Yes Yes Yes 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	Yes	

<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>
	not provided, Parties should use the notation keys as indicated.		
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;	Partly	Information on the uncertainty analysis for emissions of HFCs was not reported.
	(b) Underlying assumptions;	Yes	
	(c) Methodologies used, if any, for estimating these uncertainties.	Yes	

*Note:* The parts of the UNFCCC reporting guidelines on BURs on reporting information on GHG emissions by sources and removals by sinks in BURs are contained in decision 2/CP.17, 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 fourth biennial update report of Lebanon**

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 2/CP.17, annex III, paragraph 11	Non-Annex I Parties should provide information, in tabular format, on actions to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol.	Yes	
Decision 2/CP.17, annex III, paragraph 12	For each mitigation action or group of mitigation actions, including, as appropriate, those listed in document FCCC/AWGLCA/2011/INF.1, developing country Parties shall provide the following information, to the extent possible:		
	(a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indicators;	Partly	Information on quantitative goals was not reported for some of the mitigation actions in the transport, agriculture, forestry and other land use, and waste sectors.
	(b) Information on:		
	(i) Methodologies;	Partly	Information on methodologies was not reported for some actions in the energy and transport sectors and for all actions in the agriculture and waste sectors.
	(ii) Assumptions;	Partly	Information on assumptions was not reported for some actions in the energy and transport sectors and for all actions in the agriculture and waste sectors.

<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>
	(c) Information on:		
	(i) Objectives of the action;	Yes	
	(ii) Steps taken or envisaged to achieve that action;	Partly	Information on steps taken or envisaged was not reported for some actions in the energy and forestry and other land use sectors.
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Partly	Information on progress of implementation was not reported for some actions in the agriculture and waste sectors.
	(ii) Progress of implementation of the underlying steps taken or envisaged;	Partly	Information on progress of implementation of underlying steps taken or envisaged was not reported for some actions in the agriculture and waste sectors.
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Partly	Information on emission reductions was not reported for some actions in the energy and transport sectors and for all actions in the agriculture and waste sectors.
	(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 fourth biennial update report of Lebanon**

<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 /CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on:		
	(a) Constraints and gaps;	Yes	
	(b) Related financial, technical and capacity-building needs.	Partly	Financial and technical needs were presented by thematic area but capacity-building needs were not explicitly identified.
Decision /CP.17, annex III, paragraph 15	Non-Annex I Parties should provide:		
	(a) Information on financial resources received, technology transfer and capacity-building received;	Partly	Lebanon clarified in the BUR that the information reported is not comprehensive. Information on technology transfer was not provided.
	(b) Information on technical support received from the GEF, Parties included in	Partly	Capacity-building support received was not reported separately.

<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>
	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.		
Decision /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;	No	Lebanon clarified in the BUR that it did not report information on nationally determined technology needs with regard to the development and transfer of technology owing to lack of data.
	(b) Technology support received.	Yes	

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

#### B. UNFCCC documents

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

Summary report on the technical analysis of the third BUR of Lebanon, contained in document FCCC/SBI/ICA/2020/TASR.3/LBN. Available at <https://unfccc.int/ICA-reports>.

Third BUR of Lebanon. Available at <https://unfccc.int/BURs>.

#### C. Other documents

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

EEA. 2019. *EMEP/EEA air pollutant emission inventory guidebook 2019: Technical guidance to prepare national emission inventories*. Luxembourg: Publications Office of the European Union. Available at <https://www.eea.europa.eu/publications/emep-eea-guidebook-2019>.

Spreadsheet including the summary table of Lebanon's GHG emissions for 1994.