



---

## **Technical analysis of the fourth biennial update report of Andorra submitted on 11 March 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 Andorra, 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
CENMA	Andorra Centre for Snow and Mountain Studies
CGE	Consultative Group of Experts
CH <sub>4</sub>	methane
CNECC	National Commission on Energy and Climate Change of Andorra
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CO <sub>2</sub> eq	carbon dioxide equivalent
CRF	common reporting format
EF	emission factor
ETF	enhanced transparency framework under the Paris Agreement
F-gas	fluorinated gas
GEF	Global Environment Facility
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 for LULUCF	<i>Good Practice Guidance for Land Use, Land-Use Change and Forestry</i>
MRV	measurement, reporting and verification
N <sub>2</sub> O	nitrous oxide
NA	not applicable
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NMVOOC	non-methane volatile organic compound
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
NO <sub>x</sub>	nitrogen oxides
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
SO <sub>x</sub>	sulfur oxides
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. Andorra submitted its third BUR on 5 September 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, Andorra participated in the tenth workshop for the facilitative sharing of views, convened remotely on 2 June 2021.
5. This summary report presents the results of the technical analysis of the fourth BUR of Andorra, 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, Andorra submitted its fourth BUR on 11 March 2021 as a summary of parts of its NC2. The submission was made within two years from the submission of the third BUR.
7. A desk analysis of Andorra's BUR was conducted remotely from 28 June to 2 July 2021 and was undertaken by the following TTE, drawn from the UNFCCC roster of experts on the basis of the criteria defined in decision 20/CP.19, annex, paragraphs 2–6: Zuelclady Maria Fernanda Araujo Gutierrez (Mexico), Bertha Iris Argueta Tejeda (Honduras), Luis Caceres Silva (former member of the CGE from Ecuador), Carlos Fuller (former member of the CGE from Belize), Liviu Gheorghe (Romania), Liudmila Hristova Naydenova (Netherlands), Marcela Itzel Olguin-Alvarez (Mexico), Elisabeth Pagnac-Farbiaz (France), Jose Manuel Ramirez Garcia (Spain), Juan José Rincón Cristóbal (Spain), Raul Salas Reyes (Mexico), Alexander Valencia (Colombia) and Iván Darío Valencia (Colombia). Ms. Pagnac-Farbiaz and Mr. Salas Reyes were the co-leads. The technical analysis was coordinated by Karen Ortega Marin (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 Andorra 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 Andorra's fourth BUR, the TTE prepared and shared a draft summary report with the Party on 11 September 2021 for its review and comment. Andorra, in turn, provided its feedback on the draft summary report on 7 October 2021.

---

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

9. The TTE responded to and incorporated Andorra's comments referred to in paragraph 8 above and finalized the summary report in consultation with the Party on 19 November 2021.

## **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 Andorra'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 Andorra's fourth BUR compared with that in its third 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 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**

15. 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.

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

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

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

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

19. In its fourth BUR, Andorra provided an update on its national circumstances, including a description of national and regional development priorities, objectives and circumstances, including features of climate and economy that might affect the Party's ability to deal with mitigating and adapting to climate change, as well as information regarding national circumstances and constraints on the specific needs and concerns arising from the adverse effects of climate change and/or the impact of the implementation of response measures, as referred to in Article 4, paragraph 8, and, as appropriate, Article 4, paragraphs 9–10, of the Convention. With an area of 467.72 km<sup>2</sup> and 77,543 inhabitants in 2019, Andorra is a small country with a high population density. Andorra's economy is dominated by the services sector, accounting for over 87 per cent of gross domestic product, with retail, tourism and financial services particularly well represented. In terms of energy consumption, Andorra is dependent on fossil fuel and electricity imports for more than 90 per cent of its total energy demand. Hydropower and waste-to-energy account for 20.1 per cent of national electricity production, with recent increases in the installed capacity of photovoltaics and cogeneration. In total, 90,000 vehicles are registered in Andorra, which is renowned for fuel tourism owing to its low fuel taxes.

20. Andorra transparently reported in its fourth 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, mechanisms for information and data exchange, QA/QC procedures, and provisions for public consultation and other forms of stakeholder engagement. As reported in the previous BUR, the Energy and Climate Change Agency was created in 2015 under the Ministry of Environment, Agriculture and Sustainability, and law 21/2018 on the promotion of the energy transition and climate change was enacted. The above-mentioned law set mitigation and energy transition goals for 2030 and 2050 and established CNECC, whose composition and by-laws were laid down in 2020. CNECC is composed of 26 members, including representatives of government departments such as the Ministry of Environment, Agriculture and Sustainability; local councils; energy companies and utilities; trade associations; Andorra Chamber of Commerce, Industry and Services; academia; research and innovation institutions; professional bodies; nature protection organizations; and the Andorra Youth Forum. The main purpose of CNECC is to monitor progress in Andorra's national strategy for energy and combating climate change. Three specialized working groups on adaptation and vulnerability, education and public awareness, and mitigation have also been established.

21. Furthermore, a decree on systematic observation and registration for the preparation of the national GHG inventory was enacted in March 2020, setting out institutional responsibilities for conducting the GHG inventory. The Department of Statistics is responsible for coordinating the supply of inventory data, QC procedures for data from external sources and uncertainty estimation. The Energy and Climate Change Agency is tasked with calculating and estimating emissions for the GHG inventory and performing inventory QA. The TTE noted improvements to the information reported in the BUR,

including on the creation of CNECC and the aforementioned working groups, which provide for more transparency and wider stakeholder participation.

22. In paragraph 23 of the summary report on the technical analysis of Andorra's third BUR, the previous TTE noted areas where the transparency of the reporting on institutional arrangements could be enhanced. The current TTE noted the improvements referred to in paragraphs 20–21 above and commends the Party for enhancing the transparency of its reporting.

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

23. As indicated in table I.1, Andorra 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.

24. Andorra submitted its fourth BUR in 2021 and the GHG inventory reported is for 1990, 1995, 2000, 2005 and 2010–2019. The GHG inventory is consistent with the requirements for the reporting time frame.

25. GHG emissions and removals for the BUR covering the 1990–2019 inventories were estimated using tier 1 methodology from the 2006 IPCC Guidelines for all categories. In addition, Andorra provided in an annex to its BUR information on data and assumptions used to produce its GHG inventories, including the databases generated by the IPCC inventory software. The TTE commends Andorra for providing such detailed information and for using the 2006 IPCC Guidelines.

26. Information on AD and EFs used and their sources was clearly reported in the BUR, including information on the methodologies and sources of data used in the calculations for the GHG inventory. The Party reported using default EFs from the 2006 IPCC Guidelines for calculating direct GHGs and some country-specific EFs (from Spain). The main sources of AD are the Department of Statistics, electrical sector entities, the Department of Agriculture, the Circular Economy Unit, the Water and Environment Unit, and CENMA.

27. Information on the Party's total GHG emissions by gas for 2019 is outlined in table 1 in Gg CO<sub>2</sub> eq. It shows an increase in emissions of 48.7 per cent including land and 33.6 per cent excluding land since 1990.

Table 1  
Greenhouse gas emissions by gas of Andorra for 2019

<i>Gas</i>	<i>GHG emissions (Gg CO<sub>2</sub> eq) including land and HWP<sup>a</sup></i>	<i>% change 1990–2019</i>	<i>GHG emissions (Gg CO<sub>2</sub> eq) excluding land and HWP<sup>a</sup></i>	<i>% change 1990–2019</i>
CO <sub>2</sub>	333.78	42.7	469.60	29.1
CH <sub>4</sub>	11.77	23.8	11.77	23.8
N <sub>2</sub> O	7.94	22.7	7.94	22.7
HFCs	15.92	NA	15.92	NA
PFCs	NE	NA	NE	NA
SF <sub>6</sub>	2.30	NA	2.30	NA
Other	–	NA	–	NA
<b>Total</b>	<b>371.71</b>	<b>48.7</b>	<b>507.53</b>	<b>33.6</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)).

28. Information on emissions of NO<sub>x</sub>, CO, NMVOCs and SO<sub>x</sub> was not reported in Andorra's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that, according to data from the Department of Air Quality of the Ministry of Environment, Agriculture and Sustainability,<sup>1</sup> SO<sub>x</sub> levels are not relevant to standard air pollutant measurements. The Party also clarified that reporting emissions of CO<sub>2</sub>,

<sup>1</sup> Available at [http://www.aire.ad/current\\_levels.php](http://www.aire.ad/current_levels.php).

NMVOCs and SO<sub>x</sub> was not a priority for its national GHG inventory, since, as shown in its fourth BUR (p.45), a 2005 national survey of air pollutants for the residential, tertiary, institutional and transport sectors concluded that total emissions of these gases were below 3 t/year.

29. The use of notation keys was not consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties. Andorra used notation keys only for two years of the time series and certain subcategories. However, on the basis of the additional information provided in the annex to the BUR, the TTE noted that, in some cells where zero was reported, “NA”, “NE” or “NO” should have been reported (e.g. marine bunker fuels as “NO”). During the technical analysis, Andorra clarified that the previous TTE commented on the use of notation keys when analysing the Party’s third BUR, and Andorra therefore attempted to apply notation keys for the inventory presented in the fourth BUR using the IPCC software. However, although the Party selected them in the worksheets provided in the software, the notation keys do not appear in the sectoral tables of the report. Andorra communicated this issue to the IPCC software team of the secretariat, but a solution has not yet been provided.

30. Andorra 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. The Party reported the summary and sectoral tables generated by the IPCC inventory software, which contain inventory data for each sector, category and subcategory.

31. The shares of emissions that different sectors contributed to the Party’s total GHG emissions excluding land (category 3.B), as calculated by the TTE using information from the BUR, in 2019 are reflected in table 2.

Table 2

**Shares of greenhouse gas emissions by sector of Andorra for 2019**

<i>Sector</i>	<i>GHG emissions (Gg CO<sub>2</sub> eq)</i>	<i>% share<sup>a</sup></i>	<i>% change 1990–2019</i>
Energy	477.47	94.1	30.4
Industrial processes and product use	18.45	3.6	16 672.7
AFOLU	-129.09	-25.4	-3.8
Livestock (category 3.A)	5.62	1.1	21.1
Land (category 3.B)	-135.82	NA	-4.5
Aggregate sources and non-CO <sub>2</sub> emissions sources on land (category 3.C)	1.11	0.2	13.3
Waste	4.88	1.0	-40.0

<sup>a</sup> Share of total without 2006 IPCC Guidelines AFOLU category 3.B (land).

32. Andorra reported information on its use of GWP values consistent with those provided by the IPCC in its AR5 based on the effects over a 100-year time-horizon of GHGs.

33. For the energy sector, information was clearly reported on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories, and sources and gases that account for major emissions. CO<sub>2</sub> accounted for more than 98.3 per cent of total sectoral emissions in 2019. Transport is the subsector with by far the highest share of the total sectoral emissions (68.7 per cent), followed by commercial/institutional (14.3 per cent) and residential (12.8 per cent). Emissions from no specific industry contributed 2.2 per cent, followed by emissions from electricity generation (1.2 per cent) and heating plants (0.8 per cent). Emissions for all key categories in the energy sector were estimated using tier 1 methodology, although country-specific EFs (from Spain) were used for diesel, gasoline and natural gas.

34. Information on why CH<sub>4</sub> and N<sub>2</sub>O emissions from mobile combustion of biodiesel and bioethanol were not estimated for some subcategories in the transport subsector was not reported in Andorra’s BUR. However, the Party provided relevant clarification in its BUR.

35. For the industrial processes and product use sector, information was clearly reported on GHG emissions and their sources, methodological tier levels, AD and their sources, EFs and key categories. Within the sector, 86.3 per cent of emissions stemmed from HFCs, 12.4 per cent from SF<sub>6</sub>, 1.0 per cent from N<sub>2</sub>O and 0.3 per cent from CO<sub>2</sub>. In 2017, the subcategory with the largest share of the emissions was refrigeration and air conditioning (86.3 per cent), followed by electrical equipment (12.5 per cent), N<sub>2</sub>O for medical applications (1.0 per cent) and lubricant use (0.3 per cent). For key categories in this sector, emissions were estimated using tier 1 methodology.

36. For categories 3.A and 3.C under the AFOLU sector from the 2006 IPCC Guidelines, agricultural soils (N<sub>2</sub>O) and enteric fermentation (CH<sub>4</sub>) were identified as key categories and the most relevant emissions sources in the sector.

37. For land (category 3.B), Andorra reported annual GHG emissions and removals for 1990–2019. Overall, the net removals from land (category 3.B) fluctuated between a minimum of 130.01 CO<sub>2</sub> eq in 1990 and a maximum of 139.53 CO<sub>2</sub> eq in 2019.

38. In terms of the information used as AD, Andorra reported a single annual land conversion rate for 1990–2019, calculated as the difference in area by land-use classes on the basis of two available maps (i.e. for 1972 and 2012), divided by the number of years between the two dates (i.e. 40). During the technical analysis, the Party clarified that, with technical and scientific support from CENMA, it improved the accuracy of the annual estimates of land use and land conversions by analysing satellite images from 1984 to the present day. Andorra mentioned that, as a result of this meticulous analysis and some technical challenges when entering the AD into the IPCC software, this new approach to reporting GHG emissions took longer to implement than initially foreseen.

39. Regarding EFs, Andorra used tier 1 data from the 2006 IPCC Guidelines, assuming a constant GHG absorption rate for forest land remaining forest land. Considering the significance of this subcategory in terms of GHG emissions sequestered (accounting for about a quarter of the total GHG emissions), in its BUR Andorra identified a need to update or add new variables to better characterize biomass growth and carbon content in soil. During the technical analysis, Andorra clarified that, as part of its climate change strategy 2050, and with guidance from a group of experts from CENMA, it plans to conduct new research (e.g. using field data, remote sensing and fire risk assessments) that will provide more accurate estimates of the sink capacity of its forests, while helping it to identify additional capacity-building needs (e.g. transitioning to higher estimation tiers and monitoring more carbon pools, disturbances and the effect of management practices) as part of a continuous process to improve its GHG inventory.

40. For the waste sector, information was clearly reported on GHG emissions, methodological tier levels, AD and their sources, EFs, key categories and emissions associated with the incineration of waste in plants where energy recovery is carried out. Domestic wastewater treatment and discharge is the only emissions source reported for the sector as other activities in the waste sector are not carried out in the country. In 2019, CH<sub>4</sub> accounted for most of the sector's emissions (83.2 per cent), with N<sub>2</sub>O responsible for the remaining emissions (16.8 per cent).

41. 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 addressed anthropogenic emissions and removals for 1990–2017. The update was carried out for 1990–2019 using the methodologies contained in the 2006 IPCC Guidelines, thus generating a consistent 29-year time series. The Party reported recalculations for the energy sector for the entire time series owing to errors in the AD for subcategory 1.A.2.m; for the livestock category for 1990–2017 owing to corrections to the allocation of different types of manure management; and for the waste sector owing to changes in AD related to the organic compound of urban wastewater (subcategory 4.D.1). The Party reported that the recalculations, which were performed owing to more in-depth knowledge of the IPCC software, resulted in minor changes to estimated emissions (both increases and decreases) for the entire time series.

42. Andorra described in its BUR the institutional framework for the preparation of its 2019 GHG inventory. The Party reported that the Energy and Climate Change Agency is the



governmental body responsible for its climate change policy and GHG inventory. The Party identified improvements in the information reported in terms of its transparency and comprehensiveness, which reflect the feedback provided by the TTE during the previous technical analysis and ICA process. For example, Andorra included in its fourth BUR a new section that clearly identifies its plan for improvements by sector and by category. According to the Party, this plan, together with the implementation of a recently approved decree on systematic observation and registration for the preparation of the national GHG inventory, will enable Andorra to further strengthen its preparation and reporting of future GHG inventories.

43. Andorra clearly reported that a key category analysis was performed for the level of emissions in specific years (i.e. 1990, 1995, 2000, 2005, 2010–2019) and the trend in emissions (1990–2019) using approach 1 from the 2006 IPCC Guidelines. Andorra identified six key categories using a level assessment and nine key categories using an approach 1 trend assessment.

44. The BUR provides information on QA/QC measures for all sectors. Information was reported on the implementation of the new decree on systematic observation and registration for the preparation of the national GHG inventory and the consequent restructuring of the national inventory system, which defines the roles of each of the actors involved. The Department of Statistics has a central role in coordinating the information providers and recording data; it is responsible for performing QC checks on the data provided by the different stakeholders, checking their consistency and ensuring that information continues to be collected in a systematic way. The Energy and Climate Change Agency guarantees the quality of the inventory and its data and carries out the necessary calculations and estimates of emissions and removals as accurately and representatively as possible. The TTE commends Andorra for reporting this information on improvements to its QA/QC measures.

45. Information on CO<sub>2</sub> emissions from fuel combustion using the sectoral approach was not reported in Andorra's BUR. However, the Party provided relevant clarification in its BUR.

46. Andorra reported that no international aviation or marine bunker activities take place in the country.

47. Andorra reported information on the uncertainty assessment (level) of its national GHG inventory. The uncertainty analysis was based on the tier 1 approach and covers all direct GHGs. The results obtained, as reported in the BUR, reveal that the level uncertainty for emissions is 9.6 per cent. During the technical analysis, Andorra clarified that the uncertainty value reported in its BUR includes land use, land-use change and forestry and was generated automatically by the IPCC software on the basis of default values from the 2006 IPCC Guidelines.

48. Information on underlying assumptions was not clearly reported in Andorra's BUR. During the technical analysis, the Party clarified that assessing the uncertainty associated with information collected for the national GHG inventory is one of its main capacity-building needs. In addition, Andorra identified the needs to improve the analysis and reporting of uncertainty and further enhance the capacity of national staff and experts to prepare the national inventory through secretariat training courses.

49. The TTE noted that the transparency of the information reported on GHG inventories could be further enhanced by addressing the areas noted in paragraphs 28, 39 and 48 above, which could facilitate a better understanding of the information reported on GHG inventories.

50. In paragraph 51 of the summary report on the technical analysis of Andorra's third BUR, the previous TTE noted areas where the transparency of the reporting on GHG inventories could be further enhanced. The current TTE noted the improvements referred to in paragraphs 41, 42 and 44 above and commends the Party for enhancing the transparency of its reporting.

51. Andorra reported in its BUR (section 4) information on its areas for improvement for future BURs and its current initiatives for enhancing its GHG inventory reporting for compliance with requirements under the ETF. The initiatives relate to activities such as

implementing a national energy registry, estimating country-specific EFs, collecting data for F-gases, fertilizer use and the carbon content of soils, and updating forest characterization.

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

52. As indicated in table I.2, Andorra 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.

53. The information reported provides a comprehensive overview of the Party's mitigation actions and their effects. In its BUR, Andorra reported information on its specific national circumstances and framed its national mitigation planning and actions in the context of its updated NDC (2020). The updated NDC reinforces the actions for achieving the objectives of Andorra's first NDC (2015), which are, in the medium term, to reduce its unabsorbed GHG emissions by 37 per cent compared with 'business as usual' by 2030 and, in the long term, to achieve carbon neutrality by 2050. Andorra reported that climate change, including mitigation, has been mainstreamed and integrated in various national sectoral strategies and plans, including for biodiversity and the energy sector. Most of the mitigation actions are in the energy sector, which is the most significant sector in terms of GHG emissions and is divided into three subsectors: buildings, transport and electricity.

54. Andorra presented projections for its GHG emissions under three emissions scenarios for 2011–2050: 'business as usual' (without any mitigation measures), 'with existing measures' (including the completed actions and those currently being implemented) and 'with additional measures' (including the planned mitigation actions). The projections are based on data from 2014 that have been updated with more recent inventory values. The most notable changes concern the use of an updated version of the IPCC software and changes to the GWP values and the EFs for diesel, gasoline and natural gas. Andorra reported on expected changes that will affect future reporting, namely a new methodology based on an analysis of satellite images for studying land use, the approval of a circular economy law and improved population growth projections.

55. Under the 'business as usual' scenario, total national GHG emissions are estimated to be 643.47 Gg CO<sub>2</sub> eq in 2050. In contrast, implementing existing mitigation actions ('with existing measures' scenario) is estimated to reduce total emissions by 67.37 Gg CO<sub>2</sub> eq (10.5 per cent) by 2050 compared with the 'business as usual' scenario, owing mainly to the effects of environmental policies that have already been implemented, particularly in the areas of wastewater treatment and waste management. Implementing the 'with additional measures' scenario is expected to enable the Party to achieve carbon neutrality by 2050 through a combination of enhanced sinks and nationally appropriate mitigation actions in all key sectors for mitigation, with the energy sector being the main source of emission reductions.

56. Andorra reported a summary of its mitigation actions in tabular format in accordance with decision 2/CP.17, annex III, paragraph 11. The Party also reported information on its mitigation actions in narrative format.

57. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Andorra clearly reported the names of mitigation actions and groups of actions and provided information on the nature of the action, coverage (sector and gases) and progress indicators (section 3, tables 6.1–6.8). A clear description of the mitigation actions at the group level, as well as information on the quantitative goals for groups of actions, was provided in the BUR.

58. Andorra reported implemented and planned mitigation actions and groups of actions for all sectors. In the energy sector, three key groups of actions were reported: decarbonizing the buildings sector, promoting sustainable mobility and increasing national electricity production while reducing dependence on fossil fuels. Many of the energy sector actions are framed under law 21/2018 or Andorra's national law on energy and climate change mitigation. Mitigation actions are also under way in the AFOLU sector, which, Andorra notes, is particularly important in terms of maximizing national sink capacity, and in the waste and industrial processes sectors. Andorra also reported on the key individual mitigation actions within each group of actions.

59. Andorra clearly reported information on methodologies and assumptions, the objectives of the actions and steps taken or envisaged to achieve those actions, progress of implementation and results achieved, such as estimated outcomes and estimated emission reductions, for all implemented and planned groups of actions in the energy, land-use change and forestry, waste and industrial processes sectors.

60. In the energy sector, the actions related to buildings include renovating buildings, reducing dependence on energy from fossil fuels for heat production in buildings, managing energy efficiently and regulating the criteria for the construction of new buildings. Andorra is working on developing regulations to ensure that new buildings have almost zero energy consumption and incorporate on-site energy generation from renewable sources. Some actions build on existing efforts such as the Renova programme (2011) for renovating existing buildings. The Renova programme for reducing thermal energy needs in existing buildings in 2011–2021 led to EUR 11 million in funding being secured for 1,706 projects by 2020. Andorra intends to explore further measures that can be taken in the pre-construction phase and to lead by example by implementing measures in public buildings. Energy audits in heated buildings are a mandatory tool included in law 21/2018. Andorra explained in the BUR that all necessary energy audits are expected to be conducted by 2022.

61. The transition to sustainable mobility is an important pillar of Andorra's national policy to address climate change, as transport accounts for approximately half of energy sector emissions. The mitigation actions for this group of actions are aimed at realizing a systemic change in mobility, promoting use of public transport and bicycles, and transitioning to use of electric vehicles. In the context of law 21/2018, Andorra aims to halve GHG emissions related to internal mobility by 2030 and to achieve carbon neutrality by 2050. The mitigation actions promoting sustainable mobility have been framed in various strategic and technical instruments, such as the national mobility strategy. Institutional arrangements have been established, notably the Permanent Subcommittee for Technical Work in the Framework of Mobility under CNECC, which presents proposals related to the national strategy for sustainable mobility and its follow-up. The initiative for increasing the share of electric vehicles in the national passenger car fleet successfully boosted the share of electric vehicles in Andorra by 2019 by investing EUR 4.5 million to take 691 vehicles out of circulation and add 348 electric vehicles, 183 hybrid vehicles and 875 low-emission vehicles to the fleet.

62. Another group of mitigation actions in the energy sector is focused on increasing national installed capacity and annual generation while reducing dependence on fossil fuels. The measures are aimed at boosting energy diversification and promoting energy security and economic competitiveness. Law 21/2018, which provides the framework for the measures, promotes self-consumption, micro-cogeneration and renewable electricity generation with the aim of generating at least 75 per cent of national energy from renewable sources. Andorra's climate emergency declaration complements these measures by raising the target to 80 per cent. In 2020, Andorra approved a regulation on electricity generation that allows small-scale production and diversification of renewable energy sources. In order to facilitate renewable energy production, the Party has developed a computer application that automates and simplifies the administrative process for electricity production plants. The diversification of energy production and its potential are incorporated in the Sectoral Plan for Energy Infrastructures and further facilitated by various policies and tools.

63. For the industrial processes and product use sector, Andorra reported actions aimed at reducing the use of HFCs and PFCs, which account for about 4 per cent of its GHG emissions. The aim of these actions is to better identify and describe emissions sources and reduce consumption of HFCs and PFCs in line with the objectives of the Montreal Protocol on Substances that Deplete the Ozone Layer and, in particular, of its Kigali Amendment. The mitigation actions concern the use of a new generation of refrigerants and administrative and regulatory measures to be specified in collaboration with the relevant key economic sectors.

64. Andorra reported for the first time its actions in the AFOLU sector, which accounts for less than 2 per cent of national GHG emissions. The mitigation actions in the land-use sector promote the consumption of locally sourced food and reductions in food waste and in emissions associated with food transportation. In order to revitalize Andorra's declining agricultural activities, a law on agriculture was adopted in 2000, recognizing the key role of

agriculture in limiting urban growth and preserving the natural environment. Although promoting livestock farming has caused emissions to increase, the sectoral measures are expected to have a positive impact overall in the longer term. A number of recent private sector initiatives receiving public support have made it possible to diversify agricultural production with new crops to improve land productivity. The reported forestry actions relate to preserving and increasing the sink capacity of Andorran forests, which currently absorb about 23 per cent of the national emissions.

65. In the waste sector, the reported actions are aimed at realizing a circular economy model, which is expected to lead to significant savings in terms of the consumption of raw materials, energy and water. To this end, a circular economy law and a circular economy strategy are under preparation. In addition to reducing consumption and waste, the new regulations will also facilitate the development of labelling requirements in relation to GHG emissions for various products and services. The construction sector is one of the key sectors targeted for reuse of materials. Other reported actions include banning single-use plastics, introducing dedicated containers for separate waste collection and establishing waste deposit and recycling centres.

66. Information on the methodologies and assumptions used, GHG coverage, quantitative goals, objectives and steps taken or envisaged for some individual mitigation actions was not reported in the BUR. During the technical analysis, the Party clarified that the approaches for the methodologies described in the mitigation action tables are focused on describing the steps to achieving the objectives for each group of actions, and it specified where in the BUR the assumptions are explained. The Party provided additional information that adequately clarified the steps taken and envisaged for those actions. The Party explained that law 21/2018 establishes the energy-related future of Andorra and defines its objectives in the area of climate change. Informed by its commitments, the Long-Term National Energy Climate Change Strategy is Andorra's road map for addressing climate change, increasing its resilience to negative impacts and achieving carbon neutrality by 2050. Programme I of the strategy is based on mitigation actions aimed at reaching carbon neutrality by 2050. The objectives of the mitigation actions reported are based on a strategy that identifies the expected results for each key sector. Andorra clarified that the progress of the individual mitigation actions was evaluated using indicators for groups of actions, and shared additional information on these indicators.

67. Information on the progress of implementation of some mitigation actions and steps undertaken and results achieved, such as estimated outcomes and estimated emission reductions resulting from individual mitigation actions, was not reported in Andorra's BUR. During the technical analysis, Andorra explained that, since the energy sector is the main GHG-emitting sector in the country, it has focused its efforts on improving its reporting on the mitigation actions and their effects for that sector. The Party indicated that energy data by subsector have been identified as a gap, and it is therefore working on a national energy registry, a tool enabling its energy flows to be centrally monitored and checked. The registry will contain information on the amounts of thermal and electrical power produced, distributed, consumed, stored, imported and exported on a national scale with the aim of quantitatively determining the country's energy balance in order to provide objective, transparent information in relation to the results of the national strategies and policies.

68. Andorra is not a Party to the Kyoto Protocol and in this regard the Party indicated in its BUR that it has not used and does not intend to use international market mechanisms, but that it intends to establish a national scheme for voluntary GHG emissions trading and offsetting.

69. Andorra reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that the Party has in place a domestic MRV system for mitigation actions and is in the process of developing a new system aligned with the requirements of the ETF. Andorra reported that MRV of mitigation actions is carried out in accordance with the decree on systematic observation and registration for the preparation of the national GHG inventory, including through a public registry. The Energy and Climate Change Agency is responsible for defining and updating the accounting requirements in accordance with the relevant IPCC guidelines and methodologies. The Department of Statistics manages, processes and records the information

on mitigation actions. Andorra also reported that it is currently working on consolidating verification systems for the energy and land-use sectors. Furthermore, a national energy registry, a tool developed for law 21/2018, is expected to become operational in 2022. By enabling centralized monitoring and checks for the country's energy flows and enhancing the transparency of the associated information, the registry will help to systematize the processes for MRV of information related to the energy sector, while also serving as a verification system.

70. Further, Andorra reported consistently with the voluntary general guidelines for domestic MRV of domestically supported nationally appropriate mitigation actions, contained in the annex to decision 21/CP.19. In addition, Andorra outlined comprehensively the steps taken and envisaged for establishing an enhanced MRV system, including establishing institutional arrangements, monitoring data collection responsibilities and defining mitigation accounting standards, reporting obligations and verification approaches and roles. The two main elements of the new MRV system relate to institutional arrangements that enable key players to participate in the strategic energy and climate change policies for achieving carbon neutrality.

71. The TTE noted that the transparency of the information reported on mitigation actions could be further enhanced by addressing the areas noted in paragraphs 66–67 above, which could facilitate a better understanding of the information reported on mitigation actions.

72. In paragraph 68 of the summary report on the technical analysis of Andorra's third BUR, the previous TTE noted areas where the transparency of the reporting on mitigation actions could be enhanced. The current TTE noted the improvements referred to in paragraph 69 above, as well as the clarifications provided by the Party during the technical analysis, and commends the Party for enhancing the transparency of its reporting.

73. Andorra reported in its BUR (section 2.2.3.1) information on its current initiatives for enhancing its existing MRV system for compliance with requirements under the ETF. The initiatives relate to establishing new institutional arrangements and introducing new tools and legislation. During the technical analysis, the Party identified the need to build capacity to facilitate the transition from its current domestic MRV system for mitigation actions to the new system under the ETF.

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

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

75. Andorra 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, Andorra identified its small size and limited access to alternative energy as constraints. In terms of its national reporting, Andorra identified lack of systematized information, limited knowledge of the information contained in the reporting guidelines among external suppliers, and limited budgetary resources as constraints. With regard to the national GHG inventory, the capacity and technical constraints reported by the Party relate to, inter alia, managing the CRF Reporter and IPCC inventory software, enhancing land-cover studies employing satellite imagery, estimating sectoral energy consumption and developing country-specific EFs. With respect to mitigation, Andorra identified capacity constraints related to quantifying emission reductions resulting from mitigation actions, and financial constraints related to undertaking a country-wide mobility assessment and studies on the carbon sequestration potential of the country's forests using adaptive silvicultural practices.

76. With regard to adaptation, Andorra highlighted financial constraints in relation to undertaking adaptation research and vulnerability studies and developing national and sectoral indicators. The Party noted the difficulties involved in downscaling regional studies on the Pyrenees and the lack of private sector involvement in adaptation issues. Regarding cross-cutting issues, Andorra reported capacity constraints related to developing project proposals for international funders and its lack of a centralized platform for climate change

information. Lastly, the Party mentioned its lack of a technology needs assessment and difficulties in assessing other needs. Andorra reported that its financial, technical and capacity-building needs are to strengthen capacity for reporting GHG inventories and conducting studies and research, including through training, financial resources and technology transfer. The Party highlighted the need for a national vulnerability assessment, adaptation plans for different sectors and financial support for engaging in initiatives such as the Pyrenean Climate Change Observatory.

77. Andorra reported information on capacity-building support received in accordance with decision 2/CP.17, annex III, paragraph 15. In its BUR, Andorra reported that it did not receive support from the GEF for preparing its BUR. The information reported indicates that the Party received capacity-building support from the secretariat, the Global Support Programme for Preparation of National Communications and Biennial Update Reports by non-Annex I Parties, the CGE, the Standing Committee on Finance and the GHG Management Institute. The topics covered were using the 2006 IPCC Guidelines for preparing GHG inventories, inventory systems, CRF reporting, the ETF, the technology needs assessment process, methodologies for estimating health and adaptation costs, and information mapping related to finance flows.

78. Information on financial and technology transfer support received was not clearly reported in Andorra's BUR. During the technical analysis, the Party clarified that it did not receive any external financial resources or technology transfer support. Additionally, Andorra informed the TTE that it carries out international technical cooperation programmes for fellow developing countries through its participation in the Ibero-American Network of Climate Change Offices. The TTE commends Andorra for its activities and noted that the Party could provide this information, which could be useful for understanding the circumstances of Andorra with regard to support needed and provided, in future BURs.

79. Information on development and transfer of technology was not reported in Andorra's BUR. However, the Party clarified in its BUR that it has not yet undertaken a technology needs assessment. During the technical analysis, the Party clarified that its long-term energy and climate change strategy 2050 includes a decarbonization programme, which is built on a commitment to transition towards a model with fewer or zero emissions. The strategy includes an innovation and research programme, which identifies as a key element to be developed a value chain associated with the use of hydrogen and other energy sources such as synthesis gas obtained from renewable energy sources, especially within the transport subsector and other sectors that are difficult to decarbonize.

80. The TTE noted that the transparency of the information reported on needs and support received could be further enhanced by addressing the areas noted in paragraphs 78–79 above, which could facilitate a better understanding of the information reported on needs and support received.

81. In paragraph 76 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 constraints, gaps, needs and support needed and received could be further enhanced. The current TTE noted the improvements referred to in paragraphs 75–77 above and commends the Party for enhancing the transparency of its reporting.

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

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

(a) Enhancing national capacity to apply tier 2 or 3 methodologies for key categories, including collecting data for estimating emissions or removals and promoting technical cooperation with neighbouring countries (e.g. estimating average daily feed intake by livestock type for enteric fermentation; using forest inventory plots and reviewing existing databases and scientific literature on elements such as forest growth and management activities for forest land remaining forest land);

(b) Enhancing capacity to estimate uncertainty for all sectors and gases and report on this matter accordingly through GHG inventory courses, webinars, etc.;

(c) Strengthening the capacity of government and partner research institutions such as CENMA, through training, to use IPCC software and compilation tools, such as the CRF tables, including notation keys, to ensure consistency with the UNFCCC reporting guidelines on BURs;

(d) Enhancing capacity to identify and collect data on the use of SF<sub>6</sub> in energy production and distribution, and HFC and PFC data relating to refrigerant gases, and estimate the respective emissions accordingly;

(e) Estimating and reporting HFC and PFC emissions for the mobile air conditioning subcategory;

(f) Enhancing capacity to collect data on and estimate SO<sub>x</sub>, CO, NO<sub>x</sub> and NMVOC emissions;

(g) Further supporting the institutional arrangements and data transfer tools with key partners to ensure that high-priority activities identified in Andorra's national GHG inventory improvement plan (e.g. reporting sectoral energy consumption, annual land conversion estimates and forest carbon sequestration potential) are carried out in a timely manner and maintained within Andorra's GHG inventory system;

(h) Strengthening national capacity in relation to the new MRV system and building capacity to measure, report and verify individual actions, including identifying and selecting methodologies and assumptions and reporting quantitative and qualitative goals, progress made and results achieved, including estimated outcomes and estimated emission reductions.

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

(a) Strengthening capacity for reporting information among sectors to develop GHG inventories and national reports;

(b) Applying IPCC guidelines, particularly in relation to F-gases, energy consumption, indirect emissions, land use and management of data gaps;

(c) Conducting training on the CRF Reporter software and uncertainty analyses;

(d) Conducting studies, field measurements and research in relation to country-specific EFs and soil carbon;

(e) Identifying and quantifying emission reductions resulting from mitigation actions;

(f) Developing national adaptation indicators;

(g) Downscaling regional studies to the national level;

(h) Conducting a national vulnerability assessment;

(i) Developing adaptation plans for different sectors;

(j) Hiring full-time staff dedicated to climate change adaptation at the technical and scientific level;

(k) Identifying, assessing and reporting financial, technical and capacity-building needs;

(l) Writing and presenting funding requests, including to the GEF.

84. In paragraph 77 of the summary report on the technical analysis of Andorra's third BUR, the previous TTE, in consultation with Andorra, identified capacity-building needs. In its fourth BUR, Andorra reflected that some of those capacity-building needs have been addressed:

- (a) Building or enhancing national capacity to apply IPCC methodologies to estimate CO<sub>2</sub> emissions using the reference approach and explaining the differences between the reference and the sectoral approach;
- (b) Enhancing national capacity to develop and implement an MRV system, with a focus on assessing the advantages and disadvantages of various possible alternative systems;
- (c) Enhancing national capacity to promote public consultation and the involvement of civil society in the consultation process;
- (d) Building or enhancing national capacity to apply remote-sensing techniques for land identification and classification of land uses;
- (e) Enhancing national capacity to develop a QA/QC plan and implement it.

85. Andorra noted that the capacity-building need identified in paragraph 84(d) above was partially addressed through different training courses offered by the UNFCCC or the Greenhouse Gas Management Institute. Nevertheless, owing to the small size and particular circumstances of the country, the Party faced difficulties when attempting to apply the content of the training.

86. The following capacity-building needs listed in paragraph 77 of the summary report on the technical analysis of Andorra's third BUR were reported as pending, and several were reiterated in the fourth BUR:

- (a) For GHG inventory preparation, building or enhancing national capacity to:
  - (i) Identify and use surrogate data (e.g. for drivers) to fill data gaps in order to estimate and report on F-gases, through participation in UNFCCC training courses;
  - (ii) Assess uncertainty associated with GHG emissions and removals, AD, EFs and other parameters;
  - (iii) Estimate and report indirect GHG emissions;
  - (iv) Export GHG emission estimates and time-series data from the IPCC inventory software;
- (b) For mitigation actions and their effects, enhancing national capacity to:
  - (i) Assess and report mitigation actions and their effects;
  - (ii) Estimate emission reductions resulting from mitigation actions;
- (c) For cross-cutting issues, enhancing national capacity to:
  - (i) Conduct a technology needs assessment;
  - (ii) Draft and submit financial requests, including to the GEF, and develop and implement procedures to request funding for enabling activities.

### **III. Conclusions**

87. The TTE conducted a technical analysis of the information reported in the fourth BUR of Andorra 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; the level of support received to enable the preparation and submission of BURs; domestic MRV; and other information relevant to the achievement of the objective of the Convention. During the technical analysis, additional information was provided by Andorra. The TTE concluded that the information analysed is mostly transparent.



88. Andorra reported an update on the institutional arrangements relevant to the preparation of its BURs. The Energy and Climate Change Agency, under the Ministry of Environment, Agriculture and Sustainability, prepared the BUR. CNECC, created by law 21/2018 on the promotion of the energy transition and climate change, is a forum for stakeholder participation. The 2020 decree on systematic observation and registration for the preparation of the national GHG inventory specifies institutional responsibilities in relation to the GHG inventories, which involves collaboration between the Department of Statistics and the Energy and Climate Change Agency. Andorra has taken significant steps to establish institutional arrangements that allow for the sustainable preparation of its BURs, including by making organizational improvements and establishing knowledge-sharing procedures to facilitate sectoral information transfer.

89. In its fourth BUR, submitted in 2021, Andorra reported information on its national GHG inventory for 1990–2019. This included GHG emissions and removals of CO<sub>2</sub>, CH<sub>4</sub>, N<sub>2</sub>O, HFCs, PFCs and SF<sub>6</sub> for all relevant sources and sinks. The inventory was developed on the basis of default EF values from the 2006 IPCC Guidelines and some country-specific values (from Spain), and the IPCC software was used. The total GHG emissions for 2019 were reported as 507.53 Gg CO<sub>2</sub> eq (excluding land) and 371.71 Gg CO<sub>2</sub> eq (including land). Eleven key categories and main gases were identified (nine by the level assessment approach and six by the trend assessment approach, with some overlapping): 1.A.1 energy industries – liquid fuels (CO<sub>2</sub>), 1.A.1 energy industries – other fossil fuels (CO<sub>2</sub>), 1.A.2 manufacturing industries and construction, 1.A.3.b road transportation (CO<sub>2</sub>), 1.A.4 other sectors – liquid fuels (CO<sub>2</sub>), 2.F.1 refrigeration and air conditioning (HFCs and PFCs), 2.G other product manufacture and use (SF<sub>6</sub> and PFCs), 3.A.1 enteric fermentation (CH<sub>4</sub>), 3.B.1.a forest land remaining forest land (CO<sub>2</sub>), 3.B.2.a cropland remaining cropland (CO<sub>2</sub>) and 4.C incineration and open burning of waste (CO<sub>2</sub>). Notation keys were not reported owing to difficulties in using the IPCC software, as clarified by the Party during the technical analysis.

90. Andorra 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 2030 and 2050, and framed its national mitigation planning and actions in the context of its updated NDC (2020). Andorra aims to reduce its unabsorbed GHG emissions by 37 per cent compared with ‘business as usual’ by 2030 and seeks in the long term to achieve carbon neutrality by 2050. The Party reported actions implemented in the waste, energy, agriculture, land-use change and forestry, and industrial processes sectors. Most of the mitigation actions focus on the energy sector and are aimed at reducing CO<sub>2</sub> emissions, as the energy sector is responsible for more than 95 per cent of Andorra’s GHG emissions, while CO<sub>2</sub> emissions account for almost 90 per cent of its total unabsorbed emissions. The actions in the energy sector are aimed at promoting decarbonization in relation to the thermal needs of the buildings subsector, achieving sustainable mobility and increasing national electricity production while reducing dependence on fossil fuels, including by promoting use of renewable energy, minimizing consumption of fossil fuels and promoting energy efficiency. In the land-use change and forestry sector, the actions are aimed at promoting production and consumption of local food, diversifying food sources, reducing food waste and emissions from food transportation, and preserving and expanding the absorptive capacity of Andorra’s forests. The highest estimated outcome was reported for the energy sector of achieving carbon neutrality by 2050. Implementing existing measures is estimated to result in emission reductions totalling 67.37 Gg CO<sub>2</sub> eq by 2050 compared with ‘business as usual’. Andorra reported on its current MRV arrangements and noted that it is in the process of transitioning to a new MRV system, which will be aligned with the ETF.

91. Andorra reported information on key constraints, gaps and related needs, with constraints including lack of systematized information, limited knowledge of the information contained in the reporting guidelines among external suppliers, and limited budgetary resources. With regard to adaptation, Andorra highlighted financial constraints related to undertaking adaptation research and vulnerability studies and developing national and sectoral indicators. Andorra reported that its financial, technical and capacity-building needs are to strengthen capacity for reporting GHG inventories and conducting studies and research. It highlighted the need for a national vulnerability assessment and adaptation plans for different sectors. Information was reported on the capacity-building support received, particularly in relation to GHG inventories and the ETF. The Party reported that it did not

receive either financial support from the GEF for preparing its latest BUR or other financial or technical support from Parties included in Annex II to the Convention or from multilateral institutions. Information on technology needs was not reported, as a technology needs assessment was not conducted, as clarified by the Party in the BUR.

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 Andorra, identified the 18 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 the need for capacity-building to facilitate transition to the ETF referred to in paragraph 73 above. Andorra identified the following as priority capacity-building needs:

- (a) Strengthening the capacity of government and partner research institutions such as CENMA, through training, to use IPCC software and compilation tools, such as the CRF tables, including notation keys, to ensure consistency with the UNFCCC reporting guidelines on BURs;
- (b) Applying IPCC inventory guidelines, particularly in relation to land use;
- (c) Conducting training on uncertainty analyses;
- (d) Identifying and quantifying emission reductions resulting from mitigation actions;
- (e) Developing a national adaptation indicator;
- (f) Hiring full-time staff dedicated to climate change adaptation at the technical and scientific level.

## Annex I

### Extent of the information reported by Andorra 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 Andorra

<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	Andorra submitted its fourth BUR in March 2021; the GHG inventories reported are for 1990–2019.
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	Andorra 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 <i>Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories</i> 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	Comparable information was reported in summary tables in annexes I–III.
	(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.	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	This information was reported for 1990, 1995 and 2000.
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	

<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>
	(a) Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors);	Yes	Comparable information was reported in table 2.
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF <sub>6</sub> ).	Yes	Comparable information was reported in table 2.
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex.	Yes	The Party submitted as an annex to its BUR information on the data and assumptions used to produce its GHG inventories, including the databases generated by the IPCC inventory software.
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 <i>Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories</i> 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> ;	Yes	
	(b) CH <sub>4</sub> ;	Yes	
	(c) N <sub>2</sub> O.	Yes	
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:		
	(a) HFCs;	Yes	
	(b) PFCs;	No	
	(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) CO;	No	
	(b) NO <sub>x</sub> ;	No	
	(c) NMVOCs.	No	
Decision 17/CP.8, annex, paragraph 17	Other gases not controlled by the Montreal Protocol, such as SO <sub>x</sub> , and included in the Revised 1996 IPCC Guidelines may be included at the discretion of Parties.	No	

<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 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.	No	The information was reported only for the sectoral approach.
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 <sub>2</sub> eq should use the GWP provided by the IPCC in its AR2 based on the effects of GHGs over a 100-year time-horizon.	NA	The Party used the GWP values 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:		
	(a) Information on methodologies used in the estimation of anthropogenic emissions by sources and removals by sinks of GHGs not controlled by the Montreal Protocol;	Yes	Tier 1 methodology was used for all sectors.
	(b) Explanation of the sources of EFs;	Yes	
	(c) Explanation of the sources of AD;	Yes	
	(d) If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe:	NA	
	(i) Source and/or sink categories;		
	(ii) Methodologies;		
	(iii) EFs;		
	(iv) AD;		
	(e) Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building.	Yes	

<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 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	Andorra reported notation keys for some subcategories, but only in the annex tables and for two years of the time series.
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	Underlying assumptions were not reported.
	(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 Andorra**

<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;	Yes	
	(b) Information on:		
	(i) Methodologies;	Partly	Information on methodologies was not reported at the level of individual mitigation actions.

<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>
	(ii) Assumptions;	Partly	Information on assumptions was not reported at the level of individual mitigation actions.
	(c) Information on:		
	(i) Objectives of the action;	Yes	
	(ii) Steps taken or envisaged to achieve that action;	Yes	
	(d) Information on:		
	(i) Progress of implementation of the mitigation actions;	Yes	
	(ii) Progress of implementation of the underlying steps taken or envisaged;	Partly	Information on the underlying steps taken or envisaged was not reported at the level of some individual mitigation actions.
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Partly	Information was not reported on the estimated qualitative and/or quantitative results of some individual mitigation actions in most sectors, including on estimated outcomes, GHG emission reductions resulting from individual mitigation actions and/or co-benefits for sustainable development.
	(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 Andorra**

<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;	Yes	
	(b) Related financial, technical and capacity-building needs.	Yes	
Decision 2/CP.17, annex III, paragraph 15	Non-Annex I Parties should provide:		
	(a) Information on financial resources received, technology transfer and capacity-building received;	Partly	Information on technology development and transfer was not reported.
	(b) Information on technical support received from the GEF, Parties included in Annex II to the Convention and other developed country Parties, the Green Climate	Yes	

<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>
	Fund and multilateral institutions for activities relating to climate change, including for the 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;	No	The Party reported that it did not carry out a technology needs assessment.
	(b) Technology support received.	Yes	Andorra explained that it did not receive technology support.

*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

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

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

Summary reports on the technical analysis of the first, second and third BURs of Andorra, contained in documents FCCC/SBI/ICA/2015/TASR.1/AND, FCCC/SBI/ICA/2017/TASR.2/AND and FCCC/SBI/ICA/2020/TASR.3/AND, respectively. Available at <https://unfccc.int/ICA-reports>.

---