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## **Technical analysis of the fourth biennial update report of the Republic of Korea submitted on 30 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 the Republic of Korea, 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

|   |  |
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| 2006 IPCC Guidelines  | <i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>  |
| AD  | activity data  |
| AR  | Assessment Report of the Intergovernmental Panel on Climate Change   |
| BUR   | biennial update report   |
| CH <sub>4</sub>   | methane  |
| CO <sub>2</sub>   | carbon dioxide   |
| CO <sub>2</sub> eq  | carbon dioxide equivalent  |
| EF  | emission factor  |
| ETF   | enhanced transparency framework under the Paris Agreement  |
| F-gas   | fluorinated gas  |
| GHG   | greenhouse gas   |
| GWP   | global warming potential   |
| HFC   | hydrofluorocarbon  |
| ICA   | international consultation and analysis  |
| IE  | included elsewhere   |
| 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>   |
| KETS  | Korea Emissions Trading System   |
| KOC   | Korean offset credit   |
| KRW   | won  |
| 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   |
| NE  | not estimated  |
| NIR   | national inventory report  |
| NO  | not occurring  |
| non-Annex I Party   | Party not included in Annex I to the Convention  |
| PFC   | perfluorocarbon  |
| Revised 1996 IPCC Guidelines  | <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. The Republic of Korea submitted its third BUR on 30 November 2019, which was analysed by a TTE in the sixteenth round of technical analysis of BURs from non-Annex I Parties, conducted from 22 to 26 June 2020. After the publication of its summary report, the Republic of Korea participated in the tenth workshop for the facilitative sharing of views, convened virtually on 11 June 2021.
5. This summary report presents the results of the technical analysis of the fourth BUR of the Republic of Korea, undertaken by a TTE in accordance with the provisions on the composition, modalities and procedures of the TTE under ICA contained in the annex to decision 20/CP.19.

### B. Process overview

6. In accordance with the mandate referred to in paragraph 2 above, the Republic of Korea submitted its fourth BUR on 30 December 2021 as a stand-alone update report. The submission was made within two years and one month from the submission of the third BUR.
7. The technical analysis of the Republic of Korea's BUR was conducted from 20 to 24 June 2022 in Bonn and was undertaken by the following TTE, drawn from the UNFCCC roster of experts on the basis of the criteria defined in decision 20/CP.19, annex, paragraphs 2–6: Ahmad Wafiq Aboelnasr (Egypt), Stefania D'Annibali (Argentina), Hiroshi Ito (Japan), Roberto Lucero (Ecuador), Philippe Missi Missi (Cameroon), Helen Plume (New Zealand), Anatoli Poultouchidou (Greece), Koen E.L. Smekens (Belgium) and Sirinthornthep Towprayoon (Thailand). Ahmad Wafiq Aboelnasr and Helen Plume were the co-leads. The technical analysis was coordinated by Gopal Raj Joshi, Martina Kuehner and Claudia do Valle (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 the Republic of Korea 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 the Republic of Korea's fourth BUR, the TTE prepared and shared a draft summary report with the Republic of Korea on 1 December 2022 for its review and comment. The Republic of Korea, in turn, provided its feedback on the draft summary report on 13 February 2023.

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

9. The TTE responded to and incorporated the Republic of Korea's comments referred to in paragraph 8 above and finalized the summary report in consultation with the Republic of Korea on 15 March 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 the Republic of Korea'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 the Republic of Korea's fourth BUR compared with that in its previous BUR. Information on the GHG inventory, mitigation actions and their effects, and institutional arrangements 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 BURs.

### **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, the Republic of Korea provided an update on its national circumstances, including a description of national and regional development priorities, objectives and circumstances, including features of geography, climate and economy that might affect the Party's ability to deal with mitigating and adapting to climate change, as well as information 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.

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

21. The Republic of Korea transparently reported in its fourth BUR updated information on its 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, and the legal framework and relevant national plans regarding climate change action. The Greenhouse Gas Inventory and Research Center, under the Ministry of Environment and in close collaboration with relevant government ministries, has overall responsibility for coordinating, preparing and submitting the BUR. The Party also reported information on progress on the institutional and legal framework for the Party's NDC and long-term low-emission development strategy. The TTE noted that the Republic of Korea improved its reporting on institutional arrangements for climate actions and preparation of BURs on a continuous basis compared with the previous submission.

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

23. The Republic of Korea reported in its fourth BUR an update on its domestic MRV arrangements. The description covers key aspects of the institutional arrangements, including the functions of the 2050 Carbon Neutrality Commission and its eight joint private–government committees responsible for the implementation, monitoring, evaluation and coordination of national policies on carbon neutrality. The MRV arrangements are designed at the national level and cover two main areas: the GHG inventory system, and the progress of implementation of and results achieved from implemented mitigation actions. The implementation, checking and evaluation processes are based on the existing centralized institutional arrangements, led by the Office for Government Policy Coordination and the Ministry of Environment.

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

24. As indicated in table I.1, the Republic of Korea 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.

25. The Republic of Korea submitted its fourth BUR in 2021 and the GHG inventory reported is for 1990–2018. The GHG inventory is consistent with the requirements for the reporting time frame.

26. The Republic of Korea referenced its NIR in its BUR. During the technical analysis, the Party clarified that its NIR was developed in Korean, and that it is preparing to submit an English version of its NIR by December 2024; hence, the document has not been submitted to the secretariat and is not publicly available.

27. GHG emissions and removals for the BUR covering the 1990–2018 inventories were estimated using tier 1 and 2 methodologies from the Revised 1996 IPCC Guidelines, while in some cases the IPCC good practice guidance, the IPCC good practice guidance for LULUCF and the 2006 IPCC Guidelines were used. Methodologies from the IPCC good practice guidance were applied to some subcategories in the energy (civil aviation) and waste (landfills, wastewater treatment and waste incineration) sectors. The IPCC good practice guidance for LULUCF and the 2006 IPCC Guidelines were used for the LULUCF sector. Methodologies from the 2006 IPCC Guidelines were applied to some subcategories in the energy (fugitive emissions from natural gas), industrial processes (semiconductor and display manufacturing, and electrical equipment), agriculture (rice cultivation and agricultural soils), LULUCF (above-ground biomass of forest land and wetlands) and waste (other) sectors. The TTE commends the Party for using the 2006 IPCC Guidelines.

28. Information on EFs used and their sources was clearly reported in the BUR, including on 71 country-specific EFs for subcategories that account for approximately 88.8 per cent of total national GHG emissions. These country-specific EFs were used for estimating emissions and removals for the following subcategories: fuel combustion and fugitive emissions in the energy sector (33 country-specific EFs); cement production in the industrial processes sector (1 country-specific EF); rice cultivation and agricultural soils in the agriculture sector (13 country-specific EFs); forest land in the LULUCF sector (6 country-specific EFs); and landfills, wastewater treatment and waste incineration in the waste sector (18 country-specific EFs). The TTE noted improvements to the information on country-specific EFs reported in the BUR. The Party also reported on its use of default EFs from the 2006 IPCC Guidelines and the Revised 1996 IPCC Guidelines.

29. Information on methodologies used for developing the above-mentioned country-specific EFs and on planned improvements was not clearly reported in the Republic of Korea's BUR. During the technical analysis, the Republic of Korea clarified that the EFs were developed taking into consideration their national representativeness, the appropriateness of the methodologies and the accuracy of measurement. Additionally, these country-specific EFs were confirmed through verification, including comparative analysis with default values from the Revised 1996 IPCC Guidelines and the 2006 IPCC Guidelines. In addition, according to the Second National GHG Inventory Management Plan 2020–2024, additional country-specific EFs will be developed and verified and other action will be taken, including the revision of the CO<sub>2</sub> EFs for each fuel in the energy sector (every five years); the preparation of a development and verification plan for the CH<sub>4</sub> EFs for manure management in the agriculture sector; the development of EFs for soil carbon in the LULUCF sector; and the development of a CH<sub>4</sub> EF for solid waste disposal on land in the waste sector.

30. The Republic of Korea provided a comprehensive list of sources and data providers for the AD used for the GHG inventory, and included information on how the data were collected.

31. The TTE noted that information on updated AD used for estimating emissions was not reported in the BUR and the reason for this was not clear to the TTE. During the technical analysis, the Republic of Korea clarified that the NIR contains this information, but that it

was not clear to the Party which data on activity levels should be reported in the BUR. The Party further clarified that the missing information will be included in future submissions.

32. Information on the Party's total GHG emissions by gas for 1990–2018 is outlined in table 1 in Gg CO<sub>2</sub> eq. It shows an increase in emissions of 149.0 per cent without LULUCF since 1990 (292,190.35 Gg CO<sub>2</sub> eq).

Table 1  
**Greenhouse gas emissions by gas of the Republic of Korea for 2018**

| <i>Gas</i>       | <i>GHG emissions (Gg CO<sub>2</sub> eq) including LULUCF</i> | <i>% change 1990–2018</i> | <i>GHG emissions (Gg CO<sub>2</sub> eq) excluding LULUCF</i> | <i>% change 1990–2018</i> |
|------------------|--|---------------------------|--|---------------------------|
| CO <sub>2</sub>  | 623 126.35   | 191.6                     | 664 727.24   | 163.8                     |
| CH <sub>4</sub>  | 27 962.15  | –8.1                      | 27 678.41  | –8.4                      |
| N <sub>2</sub> O | 14 404.79  | 58.3                      | 14 372.75  | 62.9                      |
| HFCs             | 9 304.53   | 846.7                     | 9 304.53   | 846.7                     |
| PFCs             | 3 179.78   | NA                        | 3 179.78   | NA                        |
| SF <sub>6</sub>  | 8 370.59   | 4 727.3                   | 8 370.59   | 4 727.3                   |
| Other            | NA   | NA                        | NA   | NA                        |
| Total            | 686 348.19   | 169.8                     | 727 633.30   | 149.0                     |

33. Information on other emissions, including nitrogen oxides, carbon monoxide and non-methane volatile organic compounds, and other gases, such as sulfur oxides, was not reported in the Republic of Korea's BUR. However, the Party provided relevant clarification in its BUR, namely that discussions are being held with the National Air Emission Inventory and Research Centre on building a foundation for cooperation regarding the methods and procedures for using statistics to measure and report indirect GHGs. The TTE noted improvements to the information on other emissions and gases reported in the BUR.

34. The Republic of Korea applied notation keys in tables where numerical data were not provided. The use of notation keys was mostly consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties. Table 1.8 of the BUR contains an overview of categories reported as "NE".

35. The TTE noted that information on the use of "IE", "NE" and combinations of notation keys, such as "NO/NE" or "NA/NE", was not clearly reported in the Republic of Korea's BUR. During the technical analysis, the Republic of Korea clarified that those notation keys or combinations were used owing to a lack of detailed data, but stated that, when data become available from statistics or measurements, the relevant emissions will be reported in future submissions under their respective categories. It added that it experienced some difficulties in reporting on the use of notation keys and that it is endeavouring to make improvements in this regard.

36. The Republic of Korea reported comparable information addressing the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines.

37. With regard to the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF, the Republic of Korea only reported comparable information addressing table 3A.2.1A thereof, on CO<sub>2</sub> removals from growing tree biomass on forest land and from soils on grassland. It reported in the same table CO<sub>2</sub> emissions from soils on cropland and emissions of CH<sub>4</sub> from wetlands and N<sub>2</sub>O from cropland. The TTE noted improvements to the information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF reported in the BUR.

38. Information on land area per category, AD and other parameters included in the tables of annex 3A.2 to the IPCC good practice guidance for LULUCF (e.g. annual carbon loss due to commercial felling, annual volume of fuelwood gathered, carbon fraction of dry matter) that were used for estimating emissions and removals was not reported in the Republic of Korea's BUR. During the technical analysis, the Republic of Korea clarified that it lacked sufficient AD for measuring and reporting GHG emissions and removals for each land-use

category. The Party further clarified that initiatives are being undertaken to establish AD on unmeasured carbon removals and storage for each land-use category.

39. The shares of emissions that different sectors contributed to the Republic of Korea's total GHG emissions excluding LULUCF, as reported by the Party, in 2018 are reflected in table 2.

Table 2

**Shares of greenhouse gas emissions by sector of the Republic of Korea for 2018**

| <i>Sector</i>                 | <i>GHG emissions<br/>(Gg CO<sub>2</sub> eq)</i> | <i>% share<sup>a</sup></i> | <i>% change<br/>1990–2018</i> |
|-------------------------------|---|----------------------------|-------------------------------|
| Energy                        | 632 376.09                                      | 86.9                       | 163.1                         |
| Industrial processes          | 56 974.29                                       | 7.8                        | 178.7                         |
| Solvent and other product use | NE  | NA                         | NA                            |
| Agriculture                   | 21 190.51                                       | 2.9                        | 1.0                           |
| LULUCF                        | –41 285.11                                      | NA                         | 9.3                           |
| Waste                         | 17 092.40                                       | 2.4                        | 64.7                          |

<sup>a</sup> Share of total emissions without LULUCF.

40. The Republic of Korea reported information on its use of GWP values consistent with those provided by the IPCC in its AR2 based on the effects over a 100-year time-horizon of GHGs.

41. For the energy sector, information was clearly reported on GHG emission trends, methodological tier levels, AD sources, EFs, key categories and notation keys used. Within the energy sector, the energy industries category accounted for the largest share of sectoral emissions (45 per cent), followed by manufacturing industries and construction (30 per cent) and transportation (16 per cent).

42. The Republic of Korea indicated in its BUR (table 1.8) that CO<sub>2</sub> emissions for subcategories 1.B.1 (fugitive emissions from solid fuels) and 1.B.2 (fugitive emissions from oil and natural gas) were reported as “NE” owing to a lack of country-specific and/or IPCC default EFs. However, the TTE noted that CH<sub>4</sub> emissions for subcategories 1.B.1 and 1.B.2 were calculated using default EFs from the 2006 IPCC Guidelines. During the technical analysis, the Republic of Korea clarified that it mainly used the Revised 1996 IPCC Guidelines to prepare its inventory but that it intends to apply the 2006 IPCC Guidelines to cover and report key emissions and removal sources and main gases in its next GHG inventory.

43. For the industrial processes sector, information was clearly reported on GHG emission trends, methodological tier levels, AD sources, EFs, key categories and notation keys used. The cement production subcategory (CO<sub>2</sub>) is the largest emissions source, accounting for approximately 43.4 per cent of total sectoral emissions in 2018. Emissions from the industrial processes sector increased compared with the previous submission. The Party reported in its BUR that this relates to an increase in the consumption of F-gases. GHG emissions for subcategory 2.F.9 (other – provisional emissions) (HFCs) were reported as the second largest emissions source within the industrial processes sector. The Republic of Korea reported HFC emissions under subcategory 2.F.9 by applying the tier 1 method from the Revised 1996 IPCC Guidelines for estimating potential emissions.

44. The TTE noted that the Party reported inconsistent values for emissions of HFCs (such as in tables 1.2 and 2.2 of the BUR). The reason for reporting these different values was not clear to the TTE. During the technical analysis, the Republic of Korea clarified that BUR table 1.2 contained two values: (1) the potential emissions of HFCs (calculated using the IPCC tier 1 method and considering all HFC subcategories); and (2) the actual emissions of HFCs (calculated using the IPCC tier 2 method and considering only those HFC subcategories for which actual measurement was possible). The Party used the sum of those two values to obtain the national total for HFC emissions, as presented in table 2.2 of the BUR. The Party further clarified that this approach was used to prevent omissions or overlapping of some HFC subcategories for which actual measurement was very difficult.



During the technical analysis, the Party mentioned that it is planning to conduct research and analysis to improve the measurement and reporting of emissions for all HFC subcategories in future submissions.

45. Information on emissions for the subcategories asphalt roofing (2.A.5) and asphalt road paving (2.A.6) was not reported in the Republic of Korea's BUR. However, the Party used "NE" and clarified in table 1.8 that neither country-specific nor IPCC default EFs were available.

46. Information on the subcategories fugitive emissions (2.E.2) and SF<sub>6</sub> consumption in magnesium production (2.C.4) was not reported in the Republic of Korea's BUR and the reason for this was not clear to the TTE. Additionally, information on emissions of F-gases under subcategories 2.F.1 to 2.F.6 was reported for 2018 only in the BUR, and the reason for this was also not clear. During the technical analysis, the Party clarified that the missing information will be included in future submissions.

47. For the solvent and other product use sector, CO<sub>2</sub> emissions were reported as "NE" and no information was provided in the BUR as to why these emissions were not estimated. During the technical analysis, the Republic of Korea clarified that estimating CO<sub>2</sub> emissions for this sector has been challenging owing to a lack of data and information on AD. Additionally, the Party clarified that, in order to improve the quality of the national GHG inventory, it is planning to report emissions for this sector once it generates the relevant data and information.

48. For the agriculture sector, rice cultivation (CH<sub>4</sub>), 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. Together they account for about 2.2 per cent of total GHG emissions excluding LULUCF in 2018. The Republic of Korea used EFs from the 2006 IPCC Guidelines for estimating CH<sub>4</sub> emissions from rice cultivation and N<sub>2</sub>O emissions from agricultural soils, whereas all other EFs used for this sector were from the Revised 1996 IPCC Guidelines.

49. Information was not reported on actual AD, such as the number of livestock or the amount of fertilizer used, although the type of AD and the data providers were reported in the BUR. During the technical analysis, the Party clarified the reason for not reporting this information, as contained in paragraph 31 above, and its intention to include such information in future submissions.

50. For the LULUCF sector, the Republic of Korea reported annual GHG emissions and removals for 1990–2018. Overall, net removals from the LULUCF sector fluctuated between a minimum of 30,821.40 Gg CO<sub>2</sub> eq in 1993 and a maximum of 58,401.82 Gg CO<sub>2</sub> eq in 2000. For 2018, the latest reported inventory year, net removals from LULUCF amounted to 41,285.11 Gg CO<sub>2</sub> eq.

51. For the waste sector, information was clearly reported on GHG emission trends, methodological tier levels, AD sources, EFs used, key categories and notation keys used. Solid waste disposal (CH<sub>4</sub>) was the main source of emissions for this sector in 2018, followed by waste incineration (CO<sub>2</sub>).

52. Information on actual AD used and emissions from industrial wastewater (6.B.1) (CH<sub>4</sub> and N<sub>2</sub>O), sewage sludge (6.B.2.b) (N<sub>2</sub>O) and incineration (6.C) (CH<sub>4</sub>) was not reported in the Republic of Korea's BUR. The Party provided relevant clarification in BUR table 1.8, namely that the Revised 1996 IPCC Guidelines do not provide a methodology and that no country-specific EFs were available. During the technical analysis, the Party clarified that it will report the missing information in future submissions.

53. 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 NC4 and third BUR, which addresses anthropogenic emissions and removals for 1990–2016. The update was carried out for 1990–2018 using a combination of methodologies contained in the Revised 1996 IPCC Guidelines and the 2006 IPCC Guidelines, thus generating a 29-year time series.

54. Information on recalculations, including categories and years updated and recalculation methods used, was not reported in the Republic of Korea's BUR and the reason

for this was not clear to the TTE. During the technical analysis, the Party clarified that most of the recalculations were done owing to improvements in AD, and that it conducted recalculations for a total of 17 subcategories, mainly in the agriculture and waste sectors. The recalculations for 1990–2017 were undertaken owing to changes in AD in the energy (1.A.2), industrial processes (2.A.3 and 2.F.8), agriculture (4.A and 4.B), LULUCF (5.A and 5.C) and waste (6.B and 6.D) sectors; EF updates in the industrial processes (2.B.2) sector; and parameter changes in the agriculture (4.B, 4.C, 4.D and 4.F) sector. The Party improved the emission estimates for the cement production subcategory owing to the development of country-specific EFs. The TTE noted that the Party used different IPCC guidelines for different years within the same category but did not provide an explanation of how time-series-consistency issues were addressed. During the technical analysis, the Republic of Korea clarified that it will report consistent time series in future submissions.

55. The Republic of Korea 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 governmental body responsible for its climate change policy and GHG inventory, which was coordinated and prepared by the Greenhouse Gas Inventory and Research Center. Several ministries are responsible for estimating GHG emissions and removals, and the sectoral inventories are compiled by the responsible agencies and submitted to the Greenhouse Gas Inventory and Research Center. The Greenhouse Gas Inventory and Research Center chairs a technical working group, comprising external experts from academia and research institutes, government officials from relevant ministries and representatives of sectoral organizations and agencies, which provides technical advice regarding the national GHG inventory. The national GHG inventory management committee, chaired by a Vice-Minister of Environment and composed of high-level officials from the responsible ministries and Statistics Korea, evaluates and approves the final draft of the national GHG inventory. The Republic of Korea mentioned in its BUR that the national GHG inventory reports are only submitted to the secretariat after a final evaluation and approval process has been completed by the Presidential Committee on Green Growth.

56. The Republic of Korea reported the outcomes of a key category analysis performed for the level and trend assessment in tabular format (table 1.9 of the BUR). The Party identified 20 major emissions sources for the level assessment and 22 for the trend assessment. The major emissions sources for the level assessment were energy industries – solid fuels (1.A.1) (CO<sub>2</sub>), manufacturing industries and construction – solid fuels (1.A.2) (CO<sub>2</sub>) and road transportation (1.A.3.b) (CO<sub>2</sub>); whereas the major emissions sources for the trend assessment were energy industries – solid fuels (1.A.1) (CO<sub>2</sub>), other sectors – solid fuels (1.A.4) (CO<sub>2</sub>) and other sectors – liquid fuels (1.A.4) (CO<sub>2</sub>).

57. Information on the approach applied for the key category analysis was not reported in the BUR. During the technical analysis, the Republic of Korea clarified that the key category analysis (level and trend assessment including LULUCF) was conducted by applying approach 1 from the 2006 IPCC Guidelines. The Republic of Korea further clarified that it will include detailed information on the key category analysis in future submissions.

58. The Republic of Korea 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 are 622,753.93 Gg CO<sub>2</sub> eq and 629,450.91 Gg CO<sub>2</sub> eq respectively. The difference between the estimates calculated using the two approaches was reported as 1.1 per cent.

59. Information was clearly reported on emissions from international aviation and marine bunker fuels. The Party provided CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O emission estimates for international aviation and marine bunker fuels for the entire time series (1990–2018).

60. Information on an uncertainty assessment of the national GHG inventory and the underlying EFs and AD was not reported in the Republic of Korea's BUR. However, the Party provided relevant clarification in its BUR, namely that it is undertaking and planning further research to estimate the uncertainty of its GHG inventory. During the technical analysis, the Party further clarified that, on the basis of the results from ongoing and planned research, it will include detailed information on uncertainty assessments in future submissions.

61. The TTE noted that the transparency of the information reported on GHG inventories could be enhanced by addressing the areas noted in paragraphs 29, 31, 35, 38, 42, 44, 46, 47, 49, 52, 54 and 57 above, which could facilitate a better understanding of the information reported on GHG inventories.

62. In paragraph 56 of the summary report on the technical analysis of the Republic of Korea's third BUR, the previous TTE noted areas where the transparency of the reporting on GHG inventories could be enhanced. The current TTE noted the improvements referred to in paragraphs 28, 33 and 37 above and commends the Party for enhancing the transparency of its reporting.

63. The Republic of Korea reported in its BUR 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. As part of the Second National GHG Inventory Management Plan 2020–2024, the initiatives relate to expanding the scope of emission statistics including calculation of indirect GHG emissions; applying the 2006 IPCC Guidelines; developing additional country-specific emission and removal factors; improving uncertainty assessment; improving the information management system to manage and analyse data; and strengthening domestic and overseas cooperation on national GHG inventory management. The TTE commends the Republic of Korea 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**

64. As indicated in table I.2, the Republic of Korea 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.

65. The information reported provides an overview of the Party's mitigation actions and their effects. In its BUR, the Republic of Korea reported information on its national context and framed its national mitigation planning and actions in the context of the energy master plan (2008), the five-year plan on green growth (2009), the framework act on low-carbon green growth (2010), the intended nationally determined contribution (2015), the basic road map for achieving the national GHG reduction target for 2030 (2016), the climate change response master plan (2016), the revised road map for achieving the national GHG reduction target for 2030 (2018), the second climate change master plan (2019), the 2050 Carbon Neutral Strategy (2020), the framework act on carbon neutrality (2021) and the accordingly updated NDC (2021). The Republic of Korea reported that climate change has been mainstreamed in and integrated into its development plans, including mitigation. Most of the mitigation actions are in the energy transition sector.

66. The Republic of Korea submitted its intended nationally determined contribution in 2015, which included the target of reducing GHG emissions by 37 per cent below the 'business as usual' level by 2030. Guided by the revised road map for achieving the national GHG reduction target for 2030, the Party updated its NDC in 2020, which aimed to cut total national GHG emissions by 24.4 per cent compared with the 2017 level (709.1 Mt CO<sub>2</sub> eq) by 2030. Following the enactment of the framework act on climate neutrality in 2021, the Republic of Korea again updated its NDC in 2021 to further enhance its emission reduction target (i.e. to reduce total national GHG emissions by 40 per cent compared with the 2018 level (727.6 Mt CO<sub>2</sub> eq) by 2030, which amounts to a reduction of 291 Mt CO<sub>2</sub> eq). The TTE acknowledged the information, which is presented in this summary report as contextual, without assessing the completeness and transparency of the information.

67. The Party 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 comprehensive information on its mitigation actions in narrative format. This includes reporting on overarching reduction policies such as the KETS and GHG and Energy Target Management System, in addition to sectoral reduction policies and measures. The TTE noted improvements to the information on mitigation actions in tabular and narrative format reported in the BUR.

68. Consistently with decision 2/CP.17, annex III, paragraph 12(a), the Republic of Korea reported the names of mitigation actions, coverage (sector and gases) and some progress indicators in the BUR (table 3.26). A description of mitigation actions, as well as information on quantitative goals, was provided in the BUR. The TTE noted improvements in the information on coverage, quantitative goals and progress indicators for mitigation actions reported in the BUR.

69. Information on the progress indicators for several actions was not reported in the Republic of Korea's BUR and the reason for this was not clear to the TTE. This includes the actions entitled "Highly efficient energy equipment and certification system", "Project expansion by companies specializing in energy saving", "Standby power indication system" and "Factory energy management system" in the industry sector; the "Carbon point" programme in the buildings sector; and the "Intelligent traffic system" in the transport sector. During the technical analysis, the Party provided the progress indicators for the actions as well as values for the progress indicators representing the recent results achieved from each action. The TTE also noted that the description of some actions was not clearly reported in the Republic of Korea's BUR, including the differences between the "Eco-friendly green houses" and the "Zero energy buildings" actions, and the fiscal policies implemented for increasing rice cropland areas with intermittent irrigation. During the technical analysis, the Party provided information clarifying the description of the above-mentioned actions.

70. The Republic of Korea reported information on the objectives of the actions, the steps taken or envisaged to achieve those actions, and the progress of implementation of all sectoral and overarching mitigation actions. The Republic of Korea also reported information on methodologies for some of the mitigation actions. The TTE noted that the Republic of Korea's reporting on methodologies and progress of implementation of actions has improved compared with that in the previous submission.

71. Information on the methodologies, assumptions, steps taken or envisaged, and results achieved for some of the mitigation actions was not reported in the Republic of Korea's BUR and the reason for this was not clear to the TTE. Some examples include the methodologies and assumptions for the actions "KETS", "GHG and Energy Target Management System in Public Sector" and "Supporting highly efficient fuel-saving equipment of fishing ships"; and the results achieved for the actions "Encouraging less use of passenger cars and expanding operation of public transportation", "Enhancing efficiency of air transport", "Passenger car mileage" and all the actions under the forestry sector. During the technical analysis, the Party provided the missing information and clarified that the missing information is attributed to challenges in data collection, the absence of unified methodologies for the different sectors, and the need for improved coordination between the different entities.

72. The Republic of Korea provided comprehensive reporting on the three phases of the KETS. In Phase I, 23 subsectors were covered, increasing to 62 subsectors in Phase II and 69 subsectors in Phase III. In allocating emissions allowances, a benchmarking method was applied for 3 subsectors in Phase I, 7 subsectors in Phase II and 12 subsectors in Phase III. The start year of implementation was 2015, and the action was reported as ongoing. The Republic of Korea reported that over 70 per cent of the national GHG emissions are managed under the KETS. Between 2015 and 2018, the total volume of allowances traded was 86.2 Mt CO<sub>2</sub> eq. During the technical analysis, the Party clarified that, between 2015 and 2018, the Korean Exchange and over-the-counter trade volume of Korean Allowance Units increased year-on-year by 1,173, 405.9 and 111.4 per cent respectively. The Republic of Korea also reported on the total transaction amounts, which started at KRW 63.1 billion in 2015 and increased to KRW 868 billion in 2018.

73. The Republic of Korea reported on the action "GHG and Energy Target Management System in Public Sector", which focuses on designated entities and business sites that emit GHGs and consume energy above a certain level. The start year of implementation was 2010, and the action was reported as ongoing. Emission reductions of 980,000 t CO<sub>2</sub> eq were achieved in 2018 from 774 entities subject to the requirements of this action, which corresponds to a 19.6 per cent decrease compared with the baseline emissions in 2018.

74. The mitigation actions in the energy transition sector focus on (1) increasing the share of renewable energy to 20 per cent by 2030; (2) using renewable energy and liquefied natural

gas rather than coal or nuclear in new power generation facilities; (3) early closure of coal power plants that have been in operation for over 30 years by 2022; (4) recovering unused thermal energy from power generation and industry and utilizing it as a new energy source; and (5) using the renewable portfolio standard, which mandates that power generation entities with capacity above 500 MW supply a certain proportion of electricity generation from new and renewable energy or purchase corresponding renewable energy certificates. All the actions were reported as ongoing. Under the renewable portfolio standard, the share of new and renewable energy in 2019 was 6.4 per cent of the total power generation, which was 0.4 per cent higher than the target, and a total of 4,363 MW renewable energy was newly supplied, which is nearly double the target. Also in 2019, the total electricity generated from new and renewable energy sources in the country reached 51,122 GWh, which represents 8.7 per cent of the total electricity generated.

75. The mitigation actions in the industrial sector focus mainly on (1) mandating the indication of energy efficiency rating on products and simultaneously promoting highly efficient products; (2) enhancing industrial productivity and energy efficiency by supporting businesses to establish factory energy management systems; (3) imposing annual energy-saving targets on energy providers (e.g. Korea Electric Power Corporation, Korea Gas Corporation) to encourage investment in energy efficiency projects in the industrial sector (the action is entitled “EERS”); and (4) mandating companies with annual energy consumption higher than 2,000 toe to undertake periodic energy efficiency assessments and provide soft loans for energy-saving facilities. The Republic of Korea also reported on research and development projects for low-carbon innovative technologies in the steel industry and the cement industry. All the actions were reported as ongoing. For the action “EERS”, the Party reported its results in the form of potential energy savings, where it estimated that 310,948 toe energy will be saved by implementing 101 projects between 2018 and 2021 with an investment of KRW 328.5 billion.

76. The mitigation actions in the buildings sector focus mainly on (1) the gradual mandating of zero energy building certifications for new properties in both the public and the private sector; (2) developing a new standard for housing that stipulates the minimum energy performance (mitigation action entitled “Developing eco-friendly green houses”) in new buildings; (3) providing financial support for the private sector working on the green remodelling of existing buildings, and providing “carbon points” to citizens to incentivize them to reduce their consumption of electricity, water and gas; and (4) gradually raising the minimum energy efficiency standard for lighting by 2028 and expanding the application of advanced metering infrastructure in households to facilitate power demand–response based on real-time data. All the actions were reported as ongoing. The Party reported that 1,233 buildings had been certified as zero energy buildings as at 2021, and 12,005 buildings had benefited from the green remodelling financial support as at 2020. The Party also reported that 490,000 eco-friendly green houses had been built as at 2018, and that advanced metering infrastructure had been provided to 7 million households as at 2018.

77. The mitigation actions in the transport sector focus on (1) supporting the development and enhancing the technology penetration rate of hybrid vehicles (4 million by 2030), electric vehicles (3 million by 2030) and hydrogen fuel cell vehicles (0.85 million by 2030) by supporting demonstration projects and providing subsidies; (2) setting requirements for the fuel efficiency of different vehicle types (fuel efficiency for medium and large vehicles are 2 and 7.5 per cent by 2023 and 2030 respectively compared with 2021–2022); (3) setting a gradually increasing biodiesel fraction (to reach 5 per cent by 2030); and (4) minimizing time on the road by leveraging information communication technology on the basis of real-time traffic updates.

78. Other mitigation actions in road transport include (1) expanding bus rapid transit and railway networks and supplying 12,300 electric buses using battery exchange type and wireless charging by 2030; (2) providing subsidies for the modal shift of freight from road to rail transportation; and (3) connecting bicycle routes, providing “carbon points” as an incentive to bicycle users and providing a cost-saving transportation card that offers lower prices on public transport. All the actions were reported as ongoing, except for the actions related to electric buses, which are still in the planning stage. The “Intelligent traffic system” action has resulted in reducing traffic congestion by 2 per cent annually on average over the

past 10 years. The railways were extended by 4,274 km in 2018, and the freight modal shift from road to rail transportation has resulted in a shift of 7.6 billion tkm between 2010 and 2020. The bicycle routes were extended by 23,000 km in 2018, and the cost-saving transportation card resulted in a 7.6 per cent rise in the use of public transportation in 2018.

79. For maritime transport, the mitigation actions include (1) increasing the supply of new eco-friendly ships in the private sector by providing subsidies for disposal of old vessels and replacement with eco-friendly vessels; (2) mandating that new ships be green starting in 2020 and working on converting the existing fleet of 143 government-owned ships into eco-friendly vessels by 2030; (3) installing alternative maritime power supplies for ships anchored at the port instead of them using fossil fuel-powered generation; and (4) setting a target to improve fuel efficiency by 1 per cent/year in domestic aviation. All the actions were reported as ongoing. The measured fuel efficiency of the domestic aviation sector improved by 0.9 per cent in 2018.

80. The mitigation actions in the waste sector focus mainly on (1) establishing the resource circulation performance management system, which sets a target for resource circulation and monitors progress at the city and province level as well as at industrial business sites; (2) mandating enhanced producer responsibility as part of the recycling policy; (3) establishing a waste disposal levy programme focusing on local governments and waste-producing business sites that manage waste through incineration or landfill; and (4) implementing a solid refuse fuel quality grading system in 2018 and measures to enhance landfill gas recovery. All the actions were reported as ongoing. The Republic of Korea reported that the plan is to reduce emissions by 4.2 Mt CO<sub>2</sub> eq through waste reduction and increased recycling, and by an additional 0.5 Mt CO<sub>2</sub> eq through CH<sub>4</sub> recovery by 2030. The recycling ratio in 2018 increased by 15 per cent compared with 2003, and the amount of waste subjected to extended producer responsibility increased from 642,500 t in 2003 to 1,204,000 t in 2018. As at 2015, CH<sub>4</sub> amounting to 118,000 t CO<sub>2</sub> eq had been recovered from landfills.

81. The mitigation actions in the agriculture and fisheries sector focus mainly on (1) certifying the farming and stockbreeding entities that apply low-carbon agricultural technologies and hence consume fewer resources; (2) providing fiscal incentives to owners of farmland to install heating and cooling facilities powered by new renewable energy, in addition to installing energy-saving equipment; (3) increasing the areas of rice cropland that have intermittent irrigation technology and allocating finance to other low-carbon rice paddy management technologies; and (4) supporting fishing communities in replacing old inefficient engines and equipment with efficient equipment, as well as developing a highly efficient standard vessel model for littoral fishing boats. All the actions were reported as ongoing. The Low-carbon Agricultural and Livestock Product Certification System had resulted in cumulative emission reductions of 77,769 t CO<sub>2</sub> eq as at 2020 and the number of certified farming entities participating in voluntary GHG reduction projects had reached 124 compared with 60 in 2013. The length of intermittent irrigation technology for rice cultivation increased from 8,111 km in 2015 to 9,036 km in 2018. The areas of land where energy-saving equipment has been installed increased from 7,961 ha in 2015 to 11,034 ha in 2018; while the areas of land employing new and renewable energy sources increased from 944 ha to 991 ha in the same period. Utilizing energy-efficient technologies in fishing ships resulted in GHG emission reductions of 38,358 t CO<sub>2</sub> eq between 2009 and 2015, and 15,500 t CO<sub>2</sub> eq in 2016.

82. The mitigation actions in the forestry sector focus mainly on (1) promoting intensive forest management; (2) enhancing GHG sequestration capacity by choosing robust varieties for new orchards in forests, and providing economic incentives to private farm owners to encourage proactive maintenance of forests; and (3) developing new carbon sinks such as urban forests in residential areas and coastal forest belts. All the actions were reported as ongoing. The Party also reported the targeted sectoral emission reductions: it is expected that 22.1 Mt CO<sub>2</sub> eq will be absorbed by 2030.

83. The TTE noted an inconsistency in the BUR between page 46 and table 3.26 regarding the emission reductions resulting from the mitigation action “GHG and Energy Target Management System in Public Sector”. In addition, for the action “Reduce use of chemical fertilizer”, the results were reported in terms of “number of farms” while the corresponding

“performance index” was in “kg/ha”. During the technical analysis, the Party clarified that for the action “GHG and Energy Target Management System in Public Sector”, the emission reductions in 2018 were 980,000 t CO<sub>2</sub> eq. The Party also clarified that for the action “Reduce use of chemical fertilizer”, statistical values were derived from the number of farms, so it is difficult to determine emission reductions by area; hence, capacity-building of the national statistics agency is required. The Republic of Korea also clarified that it will work on improving internal coordination to avoid any future inconsistencies between the values reported.

84. The Republic of Korea provided information on its involvement in international market mechanisms through the KOCs issued for external projects reported under the KETS. The Republic of Korea documented that offset credits acquired by entities through external mitigation actions including the clean development mechanism have been recognized since Phase I of the KETS. During the technical analysis, the Party clarified that 31.7 Mt CO<sub>2</sub> eq was traded as KOCs until 2021 and it is planning to participate in a new mechanism established under Article 6 of the Paris Agreement, with a corresponding detailed implementation system currently under preparation.

85. The Republic of Korea reported information on its domestic MRV arrangements in accordance with decision 2/CP.17, annex III, paragraph 13. The information reported indicates that the Republic of Korea has in place a domestic MRV system for mitigation actions. The Republic of Korea reported that the first full-scope national and sectoral assessment report on its progress in reducing GHG emissions between 2018 and 2019 was published in December 2020. The Republic of Korea outlined that the Office for Government Policy Coordination and the Ministry of Environment analyse and evaluate progress in reducing GHG emissions by each government ministry and office. An expert team, supervised by the Greenhouse Gas Inventory and Research Center, drafts a full-scope assessment report on the basis of data received, which is then revised by the sectoral expert teams. The TTE noted improvements in the information on domestic MRV arrangements for mitigation actions reported in the BUR.

86. During the technical analysis, the Party provided further information on the roles and responsibilities of the non-governmental experts recommended by each ministry in relation to the MRV system and on the entities that define performance indices. The Republic of Korea clarified that the private sector’s efforts in reducing GHG emissions are checked and evaluated through the operation of the KETS and the GHG and Energy Target Management System. The private sector is directly involved in the entire process, including information submission and verification. The Republic of Korea also clarified that the performance indices are defined through consultations with the relevant ministries of each sector under the supervision of the Office for Government Policy Coordination and the Ministry of Environment.

87. The TTE noted that the transparency of the information reported on mitigation actions could be enhanced by addressing the areas noted in paragraphs 69, 71 and 83 above, which could facilitate a better understanding of the information reported on mitigation actions.

88. In paragraph 80 of the summary report on the technical analysis of the Republic of Korea’s third BUR, the previous TTE noted areas where the transparency of the reporting on mitigation actions (such as reporting information in tabular format and reporting information on quantitative goals and progress indicators, methodologies and assumptions, progress of implementation, involvement in international market mechanisms and domestic MRV system) could be enhanced. The current TTE noted the improvements referred to in paragraphs 67, 68, 70 and 85 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**

89. As indicated in table I.3, the Republic of Korea did not report in its BUR, in accordance with paragraphs 14–16 of the UNFCCC reporting guidelines on BURs, information on finance, technology and capacity-building needs and support received.

90. Information on constraints and gaps, and related financial, technical and capacity-building needs in accordance with decision 2/CP.17, annex III, paragraph 14, was not reported in the Republic of Korea's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Republic of Korea clarified that it did not identify any constraints or gaps because it has sufficient capacity to enhance its approach to addressing climate change. The Party clarified that it did not identify any financial, technical or capacity-building needs for international support because its needs can be met with its own capabilities and it is providing support to developing country Parties. The Republic of Korea further clarified that it is making efforts to identify areas where improvements and capacity-building activities need to be undertaken by mobilizing domestic resources and that such information will be reported in future submissions.

91. Information on financial resources, technology transfer, capacity-building and technical support received in accordance with decision 2/CP.17, annex III, paragraph 15, was not reported in the Republic of Korea's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that it did not receive any international support for activities relating to climate change. The Republic of Korea further clarified that it has sufficient capacity to mobilize domestic resources to implement various climate change activities, including the preparation of the BUR and NCs. The Republic of Korea also clarified that it is actually providing financial, technical, technology and technical support to developing country Parties.

92. Information on nationally determined technology needs with regard to the development and transfer of technology in accordance with decision 2/CP.17, annex III, paragraph 16, was not reported in the Republic of Korea's BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that it did not report on the technology needs and support received because its needs can be met with its own resources. The Party further clarified that it is actually supporting developing country Parties regarding the development and transfer of technologies to address climate change.

93. 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 90, 91 and 92 above, which could facilitate a better understanding of the information reported on needs and support received.

94. The Republic of Korea reported in its BUR on the wide range of financial, technical, technology and capacity-building support provided to developing country Parties as part of its contribution towards the global response to addressing climate change issues. The Party reported information on the national legal framework and institutions and international partner agencies relevant to mobilizing financial resources and carrying out diverse assistance projects for technical support, technology development and transfer as well as capacity-building in developing country Parties. The TTE commends the Republic of Korea for reporting on these activities. The TTE noted that this information was useful for understanding the circumstances of the Republic of Korea with regard to support needed and provided.

## **5. Any other information**

95. The Republic of Korea reported information on its third comprehensive environmental education plan (2021–2025) that aims to raise public awareness on the environment and establish a system of cooperation to jointly resolve the climate crisis. The plan focuses on four key areas: building a foundation for environmental education; facilitating environmental education at school; strengthening social environmental education; and increasing cooperation on environmental education.

96. Furthermore, the Party is collaborating with private sector companies and civil society to design and run various campaigns with the aim of disseminating climate change related information among the general public. The Republic of Korea is also contributing to enhancing the technical knowledge and capacity of international experts by designing and delivering international training programmes on climate change issues.



## D. Identification of capacity-building needs

97. In consultation with the Republic of Korea, 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 improve the reporting on GHG inventories by:
  - (i) Using default EFs from the 2006 IPCC Guidelines, where available;
  - (ii) Improving the use of and reporting on notation keys;
  - (iii) Improving estimates of F-gas emissions;
  - (iv) Including emissions from solvents and product use;
  - (v) Improving the reporting on AD, EFs and removals and emissions for all categories under the LULUCF sector;
  - (vi) Reporting comparable information addressing table 3A.2 of the IPCC good practice guidance for LULUCF;
  - (vii) Including information on recalculations and time-series consistency for some categories;
  - (viii) Including information on methodological tier used per category and data on activity levels;
  - (ix) Enhancing the capacity of data providers to estimate uncertainties of AD;
  - (x) Enhancing the capacity of GHG inventory compilers to apply IPCC uncertainty estimation methodologies to non-energy sectors;
  - (xi) Enhancing the technical capacity of inventory developers to elicit expert judgment for uncertainty assessments of AD and EFs;
- (b) Enhancing the capacity of the national statistical agencies to collect the data identified as progress indicators for the “Agriculture and fisheries” mitigation actions;
- (c) Enhancing national capacity to fully report on mitigation actions in accordance with the UNFCCC reporting guidelines on BURs;
- (d) Enhancing national capacity to engage relevant stakeholders in identifying, collecting and reporting information on financial, technical and capacity-building needs that will be addressed domestically.

98. The TTE noted that the Republic of Korea did not report any capacity-building needs in its BUR.

99. In paragraph 88 of the summary report on the technical analysis of the Republic of Korea’s third BUR, the previous TTE, in consultation with the Republic of Korea, identified and prioritized capacity-building needs. During the technical analysis, the Republic of Korea clarified that it is addressing those capacity-building needs and improvements are ongoing.

## III. Conclusions

100. The TTE conducted a technical analysis of the information reported in the fourth BUR of the Republic of Korea 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; domestic MRV advances; and the wide range of support provided to developing country Parties. The TTE

concluded that the information analysed is mostly transparent; however, the TTE also noted that the transparency of the information reported could be further enhanced in future reports.<sup>2</sup>

101. The Republic of Korea reported an update on the institutional arrangements relevant to the preparation of its BURs. The Greenhouse Gas Inventory and Research Center, under the Ministry of Environment and in close collaboration with relevant government ministries, has overall responsibility for coordinating, preparing and submitting the BUR. The domestic MRV arrangements are designed at the national level and cover two main areas: the GHG inventory system, and the progress of implementation of and results achieved from implemented mitigation actions. The Republic of Korea also reported that the 2050 Carbon Neutrality Commission and its eight joint private–government committees are responsible for the implementation, monitoring, evaluation and coordination of national policies on carbon neutrality. It has taken significant steps to establish institutional arrangements that enable sustainable preparation of its BURs, such as making organizational improvements and establishing knowledge-sharing procedures to facilitate sectoral information transfer.

102. In its fourth BUR, submitted in 2021, the Republic of Korea reported information on its national GHG inventory for 1990–2018. This included GHG emissions and removals of CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O for all relevant sources and sinks as well as the precursor gases. The inventory was developed on the basis of the Revised 1996 IPCC Guidelines, although in some cases the IPCC good practice guidance, the IPCC good practice guidance for LULUCF and specific EF values from the 2006 IPCC Guidelines were applied for some categories. Country-specific EFs were applied for about 88.8 per cent of total emissions, which represents an improvement on the previous BUR. The total GHG emissions for 2018 were reported as 727,633.29 Gg CO<sub>2</sub> eq (excluding LULUCF) and 686,348.18 Gg CO<sub>2</sub> eq (including LULUCF). A total of 20 categories and main gases were identified as key categories in the level assessment and 22 categories and main gases were identified as key categories in the trend assessment. Energy industries – solid fuels (1.A.1) (CO<sub>2</sub>) was the major emissions source for both the level and the trend assessment. Estimates of GHG emissions and removals from solvent and other product use and for several LULUCF categories were not provided owing to difficulties in obtaining the necessary data. Emission estimates of the precursor gases were also not provided owing to challenges in obtaining statistical data and in setting up MRV procedures, as clarified by the Republic of Korea in the BUR.

103. The Republic of Korea reported information on mitigation actions and their effects in both tabular and narrative format, including emission reduction targets for 2030, and framed its national mitigation planning and actions in the context of its legal and development frameworks. The aim of the updated NDC submitted by the Republic of Korea is to reduce GHG emissions in 2030 by 40 per cent compared with the 2018 level. The Republic of Korea reported planned and ongoing actions in the energy transition, industry, buildings, transport, waste, public, agriculture and livestock, and forestry sectors. The mitigation actions focus on promoting renewable energy generation and managing energy demand; improving the energy performance of buildings; promoting energy-efficient and eco-friendly technologies in the transportation sector; promoting waste recycling; enhancing resource efficiency in farming and fishing; and managing forests. The Republic of Korea reported the progress of implementation of its mitigation actions and the results achieved, including the installation of 4,363 MW of renewable energy generation capacity between 2018 and 2019, and the trading of 86.2 Mt CO<sub>2</sub> eq in the KETS between 2015 and 2018. The Republic of Korea expects to remove 22.1 Mt CO<sub>2</sub> eq in the forestry sector by 2030. The Republic of Korea also reported information on its involvement in international market mechanisms and on MRV arrangements. Information about the results for some of the actions, as well as the descriptions of actions, was not clearly reported. In addition, information on the methodologies, assumptions, steps taken and progress indicators for some of the actions was not provided owing to challenges in data collection, the absence of unified methodologies for

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<sup>2</sup> Areas in the BUR where transparency of reporting can be enhanced are GHG inventories (such as country-specific EFs, updated AD, notation keys, estimations for some subcategories, recalculations and key category analysis); mitigation actions and their effects (such as progress indicators, methodologies and assumptions, steps taken and results) and needs and support received (such as constraints, gaps and related needs, support received and nationally determined technology needs).

the different sectors, and the need for improved coordination between the different entities, as clarified by the Republic of Korea during the technical analysis.

104. The Republic of Korea did not report information on key constraints, gaps and related needs and the financial, technical, technology transfer and capacity-building support received because the Party has sufficient capacity to enhance its approach to addressing climate change, as clarified by the Party during the technical analysis. The Party further clarified that it is implementing a wide range of financial, technical, technology and capacity-building assistance projects in developing country Parties.

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

106. The TTE, in consultation with the Republic of Korea, identified the 14 capacity-building needs listed in chapter II.D above that aim to facilitate reporting in accordance with the UNFCCC reporting guidelines on BURs and participation in ICA in accordance with the ICA modalities and guidelines, taking into account Article 4, paragraph 3, of the Convention. The Republic of Korea did not prioritize any capacity-building needs.

## Annex I

## Extent of the information reported by the Republic of Korea 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 the Republic of Korea**

| <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   | The Republic of Korea submitted its fourth BUR in December 2021; the GHG inventory reported is for 1990–2018.   |
| 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   | The Republic of Korea used a combination of the Revised 1996 IPCC Guidelines and the 2006 IPCC Guidelines, as well as the IPCC good practice guidance for LULUCF and the IPCC good practice guidance.                                     |
| 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. | No  | The updated AD used to estimate emissions were not reported.  |
| Decision 2/CP.17, annex III, paragraph 6 | Non-Annex I Parties are encouraged to include, as appropriate and to the extent that capacities permit, in the inventory section of the BUR:  |   |   |
|  | (a) The tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF;  | Partly  | Comparable information was reported addressing only the information in table 3A.2.1A. Other information (e.g. annual carbon loss due to commercial felling, annual volume of fuelwood gathered, biomass density, areas) was not provided. |
|  | (b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines.   | Yes   | Comparable information was reported.  |
| Decision 2/CP.17, annex III, paragraph 7 | Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in its previous NCs.  | Partly  | The Republic of Korea used different IPCC guidelines for different years within the same category.  |
| 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 1990–2018.  |

| <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 9  | The inventory section of the BUR should consist of an NIR as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National greenhouse gas inventories), including:  |   |   |
|   | (a) Table 1 (National greenhouse gas inventory of anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol and greenhouse gas precursors);   | Yes   | Comparable information was reported in table 1.1 of the BUR.  |
|   | (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 1.1 of the BUR.  |
| 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.  | Partly  | The results of the key source analysis were presented in table 1.8 of the BUR; however, other information (e.g. on the approach used) was not reported. |
| 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   | CO <sub>2</sub> emissions were not estimated for some categories in the energy, industrial processes, LULUCF and waste sectors.                         |
|   | (b) CH <sub>4</sub> ;  | Yes   | CH <sub>4</sub> emissions were not estimated for some categories in the energy, industrial processes, agriculture, LULUCF and waste sectors.            |
|   | (c) N <sub>2</sub> O.  | Yes   | N <sub>2</sub> O emissions were not estimated for some categories in the LULUCF sector.   |
| Decision 17/CP.8, annex, paragraph 15     | Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of:   |   |   |
|   | (a) HFCs;  | Yes   |   |
|   | (b) PFCs;  | Yes   |   |
|   | (c) SF <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:  |   |   |

| <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) Carbon monoxide;  | No  |   |
|                                       | (b) Nitrogen oxides;  | No  |   |
|                                       | (c) Non-methane volatile organic compounds.   | No  |   |
| 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.  | No  |   |
| 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   |   |
| 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.  | Yes   | The Republic of Korea used the GWP provided in the AR2.   |
| 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   | The Republic of Korea used a combination of the Revised 1996 IPCC Guidelines and the 2006 IPCC Guidelines as well as the IPCC good practice guidance and the IPCC good practice guidance for LULUCF. Tier 1 and 2 methodologies were used for specific categories, as reported in table 1.4 of the BUR. |
|                                       | (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  | NA  | The Republic of Korea did not estimate anthropogenic  |

| <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>   |
|---------------------------------------|---|---|---|
|                                       | 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> <li>(e) Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building.</li> </ul>   | Partly  | emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines or the 2006 IPCC Guidelines.<br><br>The Republic of Korea reported on its data improvement plans in accordance with the Second National GHG Inventory Management Plan (2020–2024); however, it did not specifically report on capacity-building needs in this regard. |
| Decision 17/CP.8, annex, paragraph 22 | Each non-Annex I Party is encouraged to use tables 1–2 of the guidelines annexed to decision 17/CP.8 in reporting its national GHG inventory, taking into account the provisions established in paragraphs 14–17. In preparing those tables, Parties should strive to present information that is as complete as possible. Where numerical data are not provided, Parties should use the notation keys as indicated.  | Yes   | Notation keys were used.  |
| 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: <ul style="list-style-type: none"> <li>(a) Level of uncertainty associated with inventory data;</li> <li>(b) Underlying assumptions;</li> <li>(c) Methodologies used, if any, for estimating these uncertainties.</li> </ul> | No<br>No<br>No  |   |

*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 the Republic of Korea**

| <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 | Yes   | The Republic of Korea provided information in both tabular and narrative format. |

| <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>   |
|---|--|---|---|
|   | removals by sinks of all GHGs not controlled by the Montreal Protocol.   |   |   |
| 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  | A description of the mitigation actions and quantitative goals was reported; however, information on progress indicators was not reported for some of the mitigation actions in the industry, buildings and transportation sectors.                     |
|   | (b) Information on:  |   |   |
|   | (i) Methodologies;   | Partly  | Information on methodologies used for setting the ‘business as usual’ level and for the emission reduction calculations for the KETS was not reported. Information was also not reported on the methodologies applied for some of the sectoral actions. |
|   | (ii) Assumptions;  | No  |   |
|   | (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 progress of implementation of the underlying steps taken for some of the actions in different sectors was not reported.  |
|   | (iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;  | Partly  | The Republic of Korea did not report on results achieved for some of the mitigation actions in the energy transition, industry, buildings, transportation and forestry 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 the Republic of Korea**

| <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;   | No  |   |
|   | (b) Related financial, technical and capacity-building needs.   | No  |   |
| 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;  | No  |   |
|   | (b) Information on technical support received from the Global Environment Facility, Parties included in Annex II to the Convention and other developed country Parties, the Green Climate Fund and multilateral institutions for activities relating to climate change, including for the preparation of the current BUR. | No  |   |
| 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  |   |
|   | (b) Technology support received.  | No  |   |

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

## Annex II

### Reference documents

#### A. Reports of the Intergovernmental Panel on Climate Change

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

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

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

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

#### B. UNFCCC documents

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

NC1, NC2, NC3 and NC4 of the Republic of Korea. Available at <https://unfccc.int/non-annex-I-NCs>.

Summary reports on the technical analysis of the first, second and third BURs of the Republic of Korea, contained in documents FCCC/SBI/ICA/2015/TASR.1/KOR, FCCC/SBI/ICA/2018/TASR.2/KOR and FCCC/SBI/ICA/2020/TASR.3/KOR, respectively. Available at <https://unfccc.int/ICA-reports>.

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