



United Nations

FCCC/SBI/ICA/2020/TASR.3/KOR



Framework Convention on
Climate Change

Distr.: General
12 February 2021

English only

Technical analysis of the third biennial update report of the Republic of Korea submitted on 30 November 2019

Summary report by the team of technical experts

Summary

According to decision 2/CP.17, paragraph 41(a), Parties not included in Annex I to the Convention, consistently with their capabilities and the level of support provided for reporting, were to submit their first biennial update report by December 2014. Further, paragraph 41(f) of that decision states that Parties not included in Annex I to the Convention shall submit a biennial update report every two years, either as a summary of parts of their national communication in the year in which the national communication is submitted or as a stand-alone update report. As mandated, the least developed country Parties and small island developing States may submit biennial update reports at their discretion. This summary report presents the results of the technical analysis of the third biennial update report of 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

AD	activity data
BUR	biennial update report
CGE	Consultative Group of Experts
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
EF	emission factor
ETF	enhanced transparency framework (under the Paris Agreement)
EU	European Union
GHG	greenhouse gas
GIR	Greenhouse Gas Inventory and Research Center of Korea
HFC	hydrofluorocarbon
ICA	international consultation and analysis
ICT	information and communications technology
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
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
NA	not applicable
NC	national communication
NE	not estimated
NIR	national inventory report
NMVOC	non-methane volatile organic compound
NO	not occurring
non-Annex I Party	Party not included in Annex I to the Convention
NO _x	nitrogen oxides
N ₂ O	nitrous oxide
PFC	perfluorocarbon
Revised 1996 IPCC Guidelines	<i>Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories</i>
SF ₆	sulfur hexafluoride
SO _x	sulfur oxides
TTE	team of technical experts
UNFCCC guidelines for the preparation of NCs from non-Annex I Parties	“Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention”
UNFCCC reporting guidelines on BURs	“UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention”
2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>

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. The least developed countries and small island developing States may submit BURs at their discretion.
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 second BUR on 16 November 2017, which was analysed by a TTE in the tenth round of technical analysis of BURs from non-Annex I Parties, conducted from 5 to 9 March 2018. After the publication of its summary report, the Republic of Korea participated in the seventh workshop for the facilitative sharing of views, convened in Bonn on 19 June 2019.
5. This summary report presents the results of the technical analysis of the third 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 third BUR on 30 November 2019 as a summary of parts of its NC4. The submission was made within two years of the submission of the second BUR.
7. A desk analysis of the Republic of Korea's BUR was conducted from 22 to 26 June 2020¹ 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: Siriluk Chiarakorn (Thailand), Ana-Maria Danila (former member of the CGE from EU), Ryan Deosaran (Trinidad and Tobago), Madeleine Rose Diouf (former member of the CGE from Senegal), Leticia Guimarães (Brazil), Juan Luis Martin Ortega (El Salvador), Esther Mertens (Belgium), Noura Mohamed Lotfy (Egypt), Sekai Ngarize (Zimbabwe), Emma Salisbury (United Kingdom of Great Britain and Northern Ireland), Ioannis Sempos (Greece), Virginia Sena Cianci (member of the CGE from Uruguay), Chisa Umemiya (Japan), Maarten van der Eynden (Norway) and Alexander Zahar (Australia). Ms. Danila and Ms. Ngarize were the co-leads. The technical analysis was coordinated by Anna Sikharulidze, supported by Hiroaki Odawara and Sabin Guendehou (secretariat).
8. During the technical analysis, in addition to the written exchange, through the secretariat, to provide technical clarifications on the information reported in the BUR, the TTE and the Republic of Korea engaged in consultation² 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 third BUR, the TTE prepared and shared a

¹ Owing to the circumstances related to the coronavirus disease 2019, the technical analysis of the BUR submitted by the Republic of Korea had to be conducted remotely.

² The consultation was conducted via videoconferencing.

draft summary report with the Republic of Korea on 17 September 2020 for its review and comment. The Republic of Korea, in turn, provided its feedback on the draft summary report on 17 December 2020.

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 Party on 27 January 2021.

II. Technical analysis of the biennial update report

A. Scope of the technical analysis

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

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

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

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

11. The remainder of this chapter presents the results of each of the three parts of the technical analysis of 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 partially consistent with the UNFCCC reporting guidelines on BURs. Specific details on the extent of the information reported for each of the required elements are provided in annex I.

14. The TTE noted improvements in the reporting in the Party's third BUR compared with that in its second BUR. Information on the GHG inventory reported in the Party's third BUR, particularly with regard to improvements related to the development of country-specific EFs for a large number of inventory categories, demonstrates that it has taken into consideration the areas for enhancing the transparency of the information reported noted by the previous TTEs in the summary reports 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 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 third BUR, the Republic of Korea provided an update on its national circumstances, including features of geography, climate and economy that might affect the Party's ability to deal with mitigating and adapting to climate change.

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

21. Information on the existing and planned institutional arrangements relevant to the preparation of its NCs and BURs on a continuous basis was not reported in the BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that GIR, which represents the Ministry of Environment, serves as the main coordinating institution for the preparation of NCs and BURs, and cooperates with ministries, research institutions and the members of the Climate Change Division of the Presidential Committee on Green Growth. To ensure reporting on a continuous basis and enhance the quality of the process in the future, GIR will continue to take charge of national reporting under the ETF.

22. The TTE noted that the transparency of the information reported on institutional arrangements could be further enhanced by addressing the areas noted in paragraph 21 above, which could facilitate a better understanding of the information reported on institutional arrangements.

23. The Republic of Korea reported in its third BUR an update on its domestic MRV arrangements. The MRV arrangements are designed at the national level and cover two main areas: the GHG inventory system and mitigation actions. The Ministry of Environment is the lead agency, providing overall guidelines and standards for verification procedures in addition to designating and managing verification agencies. In compliance with its road map to 2030, the Republic of Korea established a comprehensive monitoring and evaluation framework to achieve its national emission reduction target by sector. The framework was piloted from 2018 to 2020 with the aim of improving and supplementing the evaluation system.

24. The Republic of Korea also established two initiatives in the agriculture sector related to verification and emission reductions: a farm–business mutual cooperation for GHG mitigation and low-carbon certification systems for agricultural and livestock products. The Party reported that, in 2020, it will monitor the progress towards its national emission reduction target through the relevant ministries and GIR will publish a comprehensive annual assessment report.

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

25. 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.

26. The Republic of Korea submitted its third BUR in 2019 and the GHG inventory reported is for 1990–2016. The GHG inventory is consistent with the requirements for the reporting time frame.

27. The Republic of Korea referenced its NIR in its BUR. However, a link to the NIR was not provided in the BUR and the document has not been submitted to the secretariat. During the technical analysis, the Party clarified that the NIR will be a part of its reporting under the ETF from 2024, and indicated that the Korean language version of the NIR has been made publicly available.

28. GHG emissions and removals for the BUR covering the 1990–2016 inventories were estimated using tier 1 and tier 2 methodologies from the Revised 1996 IPCC Guidelines, while in some cases the IPCC good practice guidance, the IPCC good practice guidance for LULUCF or the 2006 IPCC Guidelines were used. Methodologies from the IPCC good practice guidance were applied to some subcategories in the energy sector (civil aviation) and the waste sector (landfills, wastewater treatment and waste incineration) and the IPCC good practice guidance for LULUCF and the 2006 IPCC Guidelines were applied for the LULUCF sector. Methodologies from the 2006 IPCC Guidelines were applied for some subcategories in the industrial processes sector (semiconductor and display manufacturing and electric equipment), the agriculture sector (rice cultivation and agricultural soil management), the LULUCF sector (above-ground biomass of forest land and wetlands) and the waste sector (other).

29. The Party reported that, owing to the anticipated transition to the ETF, it is preparing to apply methodologies from the 2006 IPCC Guidelines for all sectors. Since 2018, GIR has been working with the relevant authorities to conduct research and carry out trial calculations with a view to improving the AD, EFs, etc., as required by the 2006 IPCC Guidelines, and the organization plans to report on these in future national GHG inventories. The TTE acknowledges these plans and considers that implementing them will ensure the consistency of the methodologies used and enhance the rigour of the emission estimates.

30. Information on EFs used and their sources was clearly reported in the BUR, including a list of the country-specific EFs used in the inventory and their sources by sector. In the BUR, 70 country-specific EFs were applied to categories that account for 80 per cent of total emissions. A total of 13 EFs were added since the Party's second BUR, covering public electricity, heat production and fugitive emissions in the energy sector, and sewage and wastewater treatment in the waste sector.

31. The Party provided a comprehensive list of the type of AD used in the GHG inventory, including sources and data providers (BUR, appendix, table 1-5).

32. The AD used to estimate emissions were not reported in the BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that the UNFCCC reporting guidelines on BURs do not make clear the required level and form of reporting the information on AD, and therefore it did not report the AD but reported their sources. Once the form of reporting AD is determined under the ETF, the Party will report the AD as part of the NIR under the ETF from 2024.

33. Information on the Party's total GHG emissions by gas for 1990–2016 is outlined in table 1 in Gg CO₂ eq. It shows an increase in emissions of 136.9 per cent without LULUCF since 1990.

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

<i>Gas</i>	<i>GHG emissions (Gg CO₂ eq) including LULUCF</i>	<i>% change 1990–2016</i>	<i>GHG emissions (Gg CO₂ eq) excluding LULUCF</i>	<i>% change 1990–2016</i>
CO ₂	592 814.21	177.5	637 599.56	152.7
CH ₄	26 288.84	–13.8	25 993.47	–14.2
N ₂ O	14 867.49	57.6	14 829.72	62.0
HFCs	7 365.92	649.5	7 365.92	649.5
PFCs	1 489.26	NA	1 489.26	NA
SF ₆	6 787.92	3 810.5	6 787.92	3 810.5
Other	NA	NA	NA	NA
Total	649 613.65	155.1	694 065.86	136.9

34. Information on emissions of other GHGs, such as NO_x, CO and NMVOCs, and of other gases, such as SO_x, was not reported in the Republic of Korea's BUR. During the technical analysis, the Party clarified that it plans to estimate its inventory of air pollutant emissions, such as CO, NO_x, NMVOC and SO_x, by 2024, in accordance with the Second National GHG Statistics Management Plan (2020–2024). Air pollutant emission data are regularly collected at the domestic level in accordance with Article 17 (Surveys on Sources and Quantities of Emissions of Air Pollutants) of the Clean Air Conservation Act. As the source categories of air pollutant emissions are currently not consistent with the categories from the 2006 IPCC guidelines, the Republic of Korea is working to update its air pollutant inventory classifications to ensure that they correspond with the UNFCCC reporting categories.

35. The Republic of Korea applied notation keys in tables where numerical data were not provided for six main GHGs and provided clarifications on the use of "NE". The use of notation keys was consistent with the UNFCCC guidelines for the preparation of NCs from non-Annex I Parties.

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

37. The Republic of Korea did not include in its BUR the tables in annex 3A.2 to the IPCC good practice guidance for LULUCF. Instead, the Party reported the annual carbon stock change for the main LULUCF subcategories in an aggregated format and provided some basic country-specific parameters for the forest land subcategory (i.e. wood density, biomass expansion factor and ratio of below-ground biomass to above-ground biomass for coniferous and broadleaf forests). The BUR did not report land area per category, AD or 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 gathering, carbon fraction of dry matter) that were used for estimating emissions and removals.

38. During the technical analysis, the Party clarified that emissions and removals for the LULUCF sector were estimated using the approach 1 methodology, which considers only net changes in land-use area, instead of the approach 2 methodology, which includes land-use conversion data where there is a lack of AD. The Republic of Korea plans to improve AD collection with a view to creating a land-use conversion matrix that will enable the approach 2 methodology to be applied in future.

39. The shares of emissions that different sectors contributed to the Party's total GHG emissions excluding LULUCF, as calculated by the TTE using information from the BUR, in 2016 are reflected in table 2.

Table 2
Shares of greenhouse gas emissions by sector of the Republic of Korea for 2016

<i>Sector</i>	<i>GHG emissions (Gg CO₂ eq)</i>	<i>% share^a</i>	<i>% change 1990–2016</i>
Energy	604 843.37	87.1	150.5
Industrial processes	51 456.09	7.4	160.2
Solvent and other product use	NE	NA	NA
Agriculture	21 245.40	3.1	–0.1
LULUCF	–44 452.21	NA	–16.2
Waste	16 521.01	2.4	58.8
Other	NA	NA	NA

^a Share of total emissions without LULUCF.

40. The Republic of Korea reported information on its use of global warming potential values consistent with those provided in the IPCC Second Assessment Report 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. A large number of country-specific EFs (33) were developed and applied by the Republic of Korea, which ensures the high quality of the inventory of the energy sector. CO₂ emissions from combustion of solid fuels in energy industries, and manufacturing industries and construction account for most emissions in this sector.

42. The Republic of Korea indicated in table 1-8 in the appendix to the BUR (p.79) that CO₂ emissions for subcategory 1.B.2.a.iv (oil refining and storage) were reported as “NE” owing to the lack of a country-specific EF. The TTE notes that the main sources of CO₂ emissions under this subcategory are activities related to flaring, hydrogen production and catalyst regeneration. During the technical analysis, the Party clarified that CO₂ emissions for activities related to flaring were not reported owing to a lack of IPCC and country-specific EFs. Emissions from hydrogen production are included in subcategory 1.A.1 (energy industries). The Republic of Korea plans to estimate emissions related to catalyst regeneration by 2023, in accordance with the Second National GHG Statistics Management Plan (2020–2024). The TTE notes that the Republic of Korea could use the IPCC default CO₂ EFs for refinery gases to estimate CO₂ emissions from flaring until it develops its own country-specific EFs.

43. For the industrial processes sector, information was clearly reported on GHG emission trends, methodological tier levels, sources of AD, EFs, key categories and notation keys used. Cement production (CO₂) is the largest emissions source in this sector, followed by subcategory 2.F.9 (other – provisional emissions) (HFCs). The Republic of Korea reported HFC emissions under subcategory 2.F.9 by applying the tier 1 method for estimating potential emissions from the Revised 1996 IPCC Guidelines.

44. HFC emissions from the consumption of halocarbons for refrigeration and cooling, blowing agents, fire extinguishers, aerosols and solvents were reported as “NO”, “NE” or “IE”. The Party reported that these emissions were not estimated owing to the absence of AD. During the technical analysis, the Party clarified that the reported HFC emission estimates were not produced separately for the above-mentioned subcategories. The Republic of Korea accounted for the potential emissions of HFC-134a, HFC-152a and HFC-23 that might have been consumed in the country instead of their actual emissions. The Party further clarified that estimating the actual emissions for the subcategories mentioned above has proved challenging owing to a lack of specific AD for each subcategory where HFCs are consumed. According to the Second National GHG Statistics Management Plan (2020–2024), the Republic of Korea plans to estimate HFC emissions for the various subcategories as actual emissions by 2023 in order to improve the quality of the national GHG inventory.

45. For the solvent and other product use sector, CO₂ 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 Party clarified that estimating CO₂ emissions from solvent

and other product use has been challenging owing to a lack of specific AD. In order to improve the quality of the national GHG inventory, the Republic of Korea plans to estimate CO₂ emissions for this sector by 2023, in accordance with the Second National GHG Statistics Management Plan (2020–2024).

46. For the agriculture sector, rice cultivation (CH₄) and agricultural soils (N₂O) were identified as the most relevant emissions sources in the sector. The Republic of Korea developed and applied 13 country-specific EFs to estimate emissions for these two categories. Additional key categories identified by the Party are manure management (N₂O) and enteric fermentation (CH₄), which account for around 1 per cent of total emissions including LULUCF.

47. For the LULUCF sector, the Republic of Korea reported annual GHG emissions and removals for 1990–2016. Overall, the net removals from the LULUCF sector fluctuated between a minimum of 31,289.33 Gg CO₂ eq in 1993 and a maximum of 59,251.46 Gg CO₂ eq in 2000.

48. The Republic of Korea reported as “NE” the biomass carbon stock change for the cropland, grassland, wetlands, settlements and other categories; the carbon stock change in dead organic matter for all land categories; and the carbon stock change in soils for forest land, settlements and other land. In addition, the Party reported CH₄ and N₂O emissions for subcategory 5.V (biomass incineration) (e.g. wildfires) as “NE” owing to a lack of AD. During the technical analysis, the Republic of Korea clarified that it was only able to partially estimate emissions and removals for the LULUCF sector. According to the Second National GHG Statistics Management Plan (2020–2024), which was established in 2020, the Republic of Korea plans to provide more detailed estimates for the aforementioned emissions and removals, including carbon stock change in dead organic matter of forest land, in the near future. The Republic of Korea further clarified that non-CO₂ emissions from biomass incineration as a result of wildfires were not estimated owing to a lack of AD. However, the statistics for growing stock volume of forest land, which were used as AD for the biomass carbon stock change of forest land, reflect the effects of wildfires.

49. For the waste sector, information was clearly reported on GHG emission trends, methodological tier levels, sources of AD, EFs, key categories and notation keys used. The Republic of Korea developed and applied 18 country-specific EFs for estimating emissions from landfills, wastewater treatment and waste incineration. Solid waste disposal is the largest emissions source (CH₄) in this sector, followed by waste incineration (CO₂).

50. The BUR provides an update to the GHG inventories reported in the Party’s previous NCs and BURs. The update was carried out for 1990–2016, thus generating a consistent 27-year time series. For the BUR, recalculations were performed for the following subcategories as a result of changes in AD: metal industry and electrical equipment in the industrial processes sector (owing to new data becoming available); rice cultivation in the agriculture sector (owing to an update of the national survey data for agriculture, forestry and fisheries for 2012–2017); and forest land in the LULUCF sector (owing to a change in the calculation method of AD). Recalculations were performed for the following subcategories owing to the development of country-specific EFs: public electricity and heat production, oil and natural gas fugitive emissions, and wastewater treatment and discharge.

51. The Republic of Korea described in its BUR the institutional framework for the preparation of its GHG inventory. The Party reported that the Ministry of Environment is the government body responsible for its climate change policy and GIR (managed by the Ministry of Environment) is responsible for its GHG inventory. A number of ministries are responsible for estimating GHG emissions and removals, and the sectoral inventories are compiled by the responsible agencies and submitted to GIR. A management committee, which is chaired by the Vice-Minister of Environment and is composed of high-level officials from the responsible ministries and Statistics Korea, and experts from academia and the public sector, approves the final draft of the national GHG inventory.

52. The Republic of Korea clearly reported that a key category analysis was performed for the level of emissions and the trend in emissions. The key category analysis was reported for 2016, while the trend analysis was reported for 2016 with 1990 as the base year.

53. The Republic of Korea clearly reported information on CO₂ fuel combustion using both the sectoral and the reference approach. For 2016, the information reported indicates that the combustion emissions estimated under the sectoral and reference approach are 595,830.85 Gg CO₂ eq and 599,211.40 Gg CO₂ eq, respectively. The difference between the estimates calculated using the two approaches was reported as 0.57 per cent.

54. Information was clearly reported on international aviation and marine bunker fuels. The Party provided CO₂, CH₄ and N₂O emission estimates for international aviation and marine bunker fuels for the entire time series (1990–2016).

55. Information on the uncertainty assessment of the national GHG inventory was not reported in the Republic of Korea's BUR. During the technical analysis, the Party clarified that since 2012 an uncertainty analysis has been performed for the energy sector, which accounts for 87 per cent of total GHG emissions, using IPCC methodologies. The Party further clarified that it faces several challenges in terms of conducting the uncertainty analysis, such as a lack of knowledge and experience, limited time and human resources, and difficulties in estimating the uncertainty values for AD, which may be considered a capacity-building need. Currently, the Republic of Korea is investigating uncertainty assessment methods for the other sectors (industrial processes, solvent and other product use, agriculture, LULUCF and waste) and plans to perform uncertainty assessments for the industrial processes and waste sectors by 2024 in accordance with the Second National GHG Statistics Management Plan (2020–2024).

56. The TTE noted that the transparency of the information reported on GHG inventories could be further enhanced by addressing the areas noted in paragraphs 32, 34, 37, 42, 44, 45, 48 and 55 above, which could facilitate a better understanding of the information reported on GHG inventories.

57. In paragraphs 28, 29, 32 and 43 of the summary report on the technical analysis of the Party's second BUR, the previous TTE noted areas where the transparency of the reporting on data sources for AD and EFs, the use of the notation key "NE" and the reference approach could be enhanced. The current TTE noted the improvements referred to in paragraphs 30, 31, 35 and 53 above and commends the Party for enhancing the transparency of its reporting.

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

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

59. 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 its nationally determined contribution communication (June 2015), the Framework Act on Low Carbon Green Growth (May 2016) and the 2030 National GHG Reduction Roadmap (July 2018), including its national emission reduction target for 2030.

60. The Republic of Korea's nationally determined contribution includes a GHG emission reduction target of 37 per cent below the level of the 'business as usual' scenario by 2030, which was later enforced through an amendment to the Enforcement Decree of the Framework Act on Low Carbon Green Growth. In its comments to the draft summary report, the Republic of Korea further clarified that it is currently revising its target relative to 2017 (24.4 per cent reduction in GHG emissions by 2030 compared with the 2017 level) through the above-mentioned amendment. Further, the Republic of Korea reported in its BUR that it is conducting research to develop its national 2050 long-term low-carbon development strategy, to be submitted in 2020 in accordance with the Paris Agreement.

61. The Republic of Korea reported that climate change has been mainstreamed in and integrated into its development plans, including mitigation. The Party reported its mitigation actions of the KETS, the GHG and Energy Target Management System and various actions in the energy transformation, industrial, buildings, transportation, waste, agriculture and

livestock, and forestry sectors, and in the public sector. Most of the mitigation actions are in the energy sector.

62. In relation to decision 2/CP.17, annex III, paragraph 11, the Republic of Korea mostly reported information on its mitigation actions in narrative format, with some information presented in tabular format, which made it difficult to distinguish specific mitigation actions and their characteristics. The reason for this was not clear to the TTE. During the technical analysis, the Party clarified that in preparation for the ETF, and pursuant to its 2030 National GHG Reduction Roadmap, it had decided to establish a comprehensive monitoring and evaluation framework to facilitate the implementation and achievement of its national emission reduction target. As the Party was in the process of redesigning its mitigation actions and their indicators and implementing its new monitoring and evaluation framework at the time of drafting its third BUR, and because staff had been diverted from BUR reporting to help finalize the new framework, it decided to postpone detailed reporting of its mitigation actions until its fourth BUR. The circumstances summarized in this paragraph also account for most of the transparency issues identified below.

63. The Party further clarified that pursuant to the decision to establish the new monitoring and evaluation framework, in a joint ministerial effort led by the Ministry of Environment, it identified its future mitigation actions and their related performance indicators and timelines, and created new institutional arrangements to oversee their implementation. The new monitoring and evaluation framework will become operational from January 2020, and the first report, which will reflect the progress of the Party's mitigation actions and their contribution to the national emission reduction target based on the data and results from 2018 to 2019, is due in the last quarter of 2020.

64. Consistently with decision 2/CP.17, annex III, paragraph 12(a), the Republic of Korea reported in the BUR the names of mitigation actions or groups of actions, a description of those actions, information on their nature and sector coverage and some quantitative goals.

65. Information on the gases covered by the mitigation actions and on the quantitative goals and progress indicators for many actions was not reported in the BUR and the reason for this was not clear to the TTE. During the technical analysis, the Party clarified that it had specified the quantitative goals and progress indicators of its mitigation actions in its NC4. The Party also clarified that the coverage of gases has not changed for any mitigation actions since its second BUR.

66. The Republic of Korea clearly reported information on the objectives of its mitigation actions and steps taken or envisaged to achieve them for all actions, methodologies for the actions in the energy transformation sector, and the progress of implementation and results achieved for some of its actions.

67. The Republic of Korea reported on the KETS and the GHG and Energy Target Management System. The KETS covered 525 large companies in its first phase (2015–2017) and 591 large companies in its second phase (2018–2020). In terms of the results achieved, the Party reported that the preliminary allocation for the operation of Phase I was 1,622.6 million Korean Allowance Units, with an additional allocation of 43.3 million units. In addition, the Party reported that 22.5 million Korean Offset Credits had been supplied to the market through 81 external reduction projects as at August 2018, resulting in reductions in N₂O emissions (9.66 Mt CO₂ eq) and SF₆ emissions (4.57 Mt CO₂ eq) and those attributed to using landfill gas (5.88 Mt CO₂ eq), using new and renewable energy (2.12 Mt CO₂ eq), fuel conversion (0.21 Mt CO₂ eq) and supplying bioenergy (0.03 Mt CO₂).

68. A related mitigation action, the GHG and Energy Target Management System, applies to small and medium-sized companies (348 in total in 2017), preparing them for the KETS before they are eligible to participate. It sets emission targets for the companies involved in the system and imposes improvement orders or fines if a company fails to meet its targets.

69. For the energy sector, the Party reported actions for energy transformation, industry, buildings and the public sector. For the energy transformation sector, the Party's energy transformation road map, which is supported by master plans for electricity supply and energy, contains a plan to phase out nuclear power plants and increase the share of renewable energy in power generation to 30–35 per cent by 2040. In support of this goal, the Party has

implemented a renewable portfolio standard and increased the annual mandatory renewable energy supply rate from 2.0 to 5.0 per cent between 2012 and 2018, which is set to rise to 10 per cent after 2023. The Party reported that following the implementation of the renewable portfolio standard, total renewable energy generation increased from 17,346 GWh in 2011 to 46,619 GWh in 2017, and the share of renewable energy generation in total power generation increased with about 4.61 per cent over the same period.

70. The Republic of Korea reported that legal instruments relating to energy demand management include statutes such as the Framework Act on Low Carbon Green Growth, the Energy Act and the Energy Use Rationalization Act. In the industrial sector, actions focus on improving energy efficiency and demand management. For example, energy-use rationalization funds are used by the Government to support companies investing in energy-saving facilities by providing a part of the necessary capital.

71. The Republic of Korea reported that the Green Buildings Establishment Support Act of 2013 and the corresponding master plans set the policy framework for the GHG emission reduction target in the building sector. One of the actions relates to a certification system for zero-energy buildings, established in January 2017, which aims to reduce emissions by 5.5 Mt CO₂ eq by 2030. With regard to actions in the public sector, the GHG and Energy Target Management System was applied to 826 public sector institutions in 2017, including central administrative agencies, local governments, public institutions and national universities. During the first period (2011–2015), the scheme aimed to reduce emissions by 20 per cent compared with the base-year level by 2015; the target rises to a 30 per cent emission reduction by 2020 during the second period (2016–2020). The Party reported that the Ministry of Environment has been providing financial support to implement this action, which resulted in a 12 per cent emission reduction in 2017 compared with the 2011 level.

72. The Republic of Korea's mitigation actions in the transportation sector are divided into several categories: roads, shipping, railway and aviation. Under the first of these categories, the Passenger Cars Average Fuel Efficiency System established an average fuel efficiency target for 2020 that matches the targets of developed countries. Another example is the Renewable Fuel Standard, which mandates a certain ratio of biodiesel (mainly from recycled cooking oil) in diesel supplied for transportation, which was 3 per cent in 2018. In the aviation sector, the Government has concluded an agreement on voluntary GHG reductions with the national flag-carrying airlines. This action resulted in emission reductions of approximately 450,000 t CO₂ eq by 2017, thanks to improvements in fuel efficiency, air traffic control and airport operations. Moreover, improvements to the operational efficiency of railway transportation and increased capacity led to GHG emission reductions of 945,000 t CO₂ eq by 2018.

73. The mitigation actions in the waste sector include the establishment in 2018 of the Party's first Resource Circulation Action Plan (2018–2027) by its Ministry of Environment as a blueprint for transforming the Party's economic and social structure into a resource circulation system. The Republic of Korea further reported on the key indicators on low-carbon development and resource circulation in its 4th National General Environmental Plan of 2015, which include increasing the recycling rate to 97 per cent by 2035 (it was at 83.2 per cent in 2013) and reducing emissions from 688 Mt CO₂ eq in 2012 to 536 Mt CO₂ eq by 2030.

74. In the forestry sector, a forest carbon offset system has been in place since 2013. The Party reported that, as at 2017, 157 projects were registered under the offset system, with an annual estimated forest carbon removal of 119,000 t CO₂ eq.

75. The Party also reported mitigation actions in the agriculture and livestock sector. The action plan on climate change in agriculture, fisheries and foods (2011–2020) was adopted in November 2011 and aims to proactively respond to climate change in these sectors. The agricultural and rural areas voluntary GHG reduction project, which was launched in 2012, acts as a carbon offset system and encourages farmers to reduce GHG emissions through economic incentives. The national low-carbon certification system for agricultural products recognizes the use of low-carbon agricultural technologies in agricultural products by granting Good Agricultural Practices certification. By December 2017, 478 agricultural management bodies (2,763 farms) had been certified since the project began in 2012.

76. The Republic of Korea did not report information on methodologies and assumptions for any of its mitigation actions, except for methodologies in the energy transformation sector. The reason for this was not clear to the TTE. During the technical analysis, the Party clarified that the results of the actions were estimated as differences between the ‘business as usual’ and mitigation scenarios, which were built on the basis of sector-specific technology databases, baseline assumptions for demand growth and major policies and measures. The energy system models were used to calculate the emission mitigation potential from energy consumption. In the case of the non-energy sectors, sectoral AD in the industrial processes, waste, and agriculture, forestry and fishery sectors were first projected, and then EFs were applied according to the national inventory estimation methods. The Republic of Korea also clarified the key parameters used for the assumptions relating to its mitigation actions.

77. Although the Republic of Korea reported information on the progress of implementation of some of its mitigation actions (i.e. those in the public sector and for the KETS), it did not always clearly report whether each action was completed, ongoing or planned, or whether the action was progressing as planned or changes had been made to ensure its success. The underlying steps taken or envisaged were not reported. The Party did not report information on estimated emission reductions achieved by some of the actions and the reason for these omissions was not clear to the TTE. During the technical analysis, the Party confirmed that it had only partially reported information relating to paragraph 12(d) of the UNFCCC reporting guidelines on BURs. The Party referred to difficulties arising from its ongoing transition to a new comprehensive monitoring and evaluation framework (see the discussion in paras. 62–63 above) and clarified that it intends to use detailed information captured through that framework to report on its mitigation actions in its next BUR.

78. The Republic of Korea did not provide information on its involvement in international market mechanisms, other than the information on Korean Offset Credits through external projects reported under the KETS (see para. 67 above). The reason for this was not clear to the TTE. During the technical analysis, the Party clarified that 80 clean development mechanism projects were under way in the country. The Party also clarified that it was awaiting progress on decisions relating to Article 6 of the Paris Agreement before deciding which other international market mechanisms it would engage with. The Republic of Korea stated that it would include detailed information on this matter in its next BUR.

79. The Republic of Korea did not report information on its domestic MRV arrangements, contrary to decision 2/CP.17, annex III, paragraph 13. As noted in paragraphs 62–63 above, the Party explained that its new comprehensive monitoring and evaluation framework was not fully operational for the preparation of its third BUR. The Party stated that detailed information relating to decision 2/CP.17, annex III, paragraph 13, would be reported in its next BUR.

80. The TTE noted that the transparency of the information reported on mitigation actions could be enhanced by addressing the areas noted in paragraphs 62, 65 and 76–79 above, which could facilitate a better understanding of the information reported on mitigation actions.

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

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

82. Information on constraints and gaps, and related financial, technical and capacity-building needs was not reported in the BUR and no reason was provided in the BUR. 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 further clarified that it did not identify any financial, technical or capacity-building needs because its needs can be met with its own resources.

83. Information on financial resources, technology transfer, capacity-building and technical support received was not reported in the BUR, and no reason was provided in the BUR. The only exception was reporting of co-financing support from the EU via an emissions trading scheme project between the EU and the Party (2016–2018), which

established systems for mutual learning and knowledge-sharing. During the technical analysis, the Party clarified that it did not receive any other financial resources, technology transfer, capacity-building or technical support from the Global Environment Facility, Annex II Parties or other developed country Parties, the Green Climate Fund or multilateral institutions for activities relating to climate change. The Republic of Korea further clarified that it did not receive any external support for the preparation of the BUR and that it relies exclusively on its own financial resources for the preparation of its national reports, including its NCs, NIRs and BURs.

84. The Republic of Korea did not report the information required by decision 2/CP.17, annex III, paragraph 16, on nationally determined technology needs with regard to the development and transfer of technology. During the technical analysis, the Republic of Korea clarified that the Ministry of Science and ICT has identified in the 2016 Climate Technology Roadmap 10 green or climate-related technologies that the Party aims to secure and is promoting research and development to this end. The Republic of Korea has also established the Clean Energy Technology Developmental Strategy for Climate Change Response and New Industry Creation (2016) with the aim of securing investment in clean energy technology development to reduce GHG emissions and support new industries and encouraging private investment by establishing a foundation of market-oriented policies.

85. The TTE noted that the transparency of the information reported on needs and support received could be further enhanced by addressing the areas noted in paragraph 84 above, which could facilitate a better understanding of the information reported on needs and support received.

86. The Republic of Korea reported on the wide range of financial, technical and capacity-building support it provides to other developing countries as part of its involvement in global action against climate change. 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 Party with regard to support needed and provided.

5. Any other information

87. The Republic of Korea reported wide-ranging information on support provided to developing country Parties, such as finance, technology development and transfer, and capacity-building support, in addition to information on concessional loans and grants through official development assistance to developing country Parties. The Party provided in tables 2.1–2.2 of the appendix to the BUR information on the monetary amounts, status, funding sources, financial instruments, support type and sectors identified for the support it provides to multilateral institutions and at the bilateral and regional level, and information on support provided through other channels. It also provided information on capacity-building support in table 3.1 of the appendix to the BUR.

D. Identification of capacity-building needs

88. 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 the capacity of data providers to estimate uncertainties of AD;
- (b) Enhancing the capacity of GHG inventory compilers to apply IPCC uncertainty estimation methodologies to non-energy sectors;
- (c) Enhancing the technical capacity of inventory developers to elicit expert judgments for uncertainty assessments of AD and EFs.

89. During the technical analysis, the Republic of Korea clarified that identified capacity-building needs will be addressed domestically, and outlined corresponding plans and activities.

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

91. In paragraph 64 of the summary report on the technical analysis of the Republic of Korea's second BUR, the previous TTE, in consultation with the Republic of Korea, identified and prioritized one capacity-building need. This capacity-building need has not yet been addressed and has been included in the list of capacity-building needs in paragraph 88 above.

III. Conclusions

92. The TTE conducted a technical analysis of the information reported in the third BUR of the Republic of Korea in accordance with the UNFCCC reporting guidelines on BURs and concludes that the information reported is partially consistent. It provides an overview of national circumstances and institutional arrangements relevant to the preparation of NCs on a continuous basis; an overview of the national inventory of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol; information on mitigation actions and their effects; and other information relevant to the achievement of the objective of the Convention, including information on support provided to developing country Parties. During the technical analysis, additional information was provided by the Republic of Korea on the process of redesigning its mitigation actions and their indicators and implementing its new monitoring and evaluation framework. The TTE concluded that the information analysed is partially transparent.

93. The Republic of Korea did not report updated information on the institutional arrangements relevant to the preparation of its BURs. During the technical analysis, the Party clarified that GIR, which represents the Ministry of Environment, serves as the main coordinating institution for the preparation of NCs and BURs, cooperating with ministries and research institutions. GIR will continue to take charge of national reporting to ensure reporting on a continuous basis and enhance the quality of the process in the future. The Party reported an update on its domestic MRV arrangements covering two main areas: the GHG inventory system and mitigation actions. It has taken significant steps to establish institutional arrangements that allow for the sustainable preparation of its BURs. These include making organizational improvements and establishing knowledge-sharing procedures to facilitate sectoral information transfer.

94. In its third BUR, submitted in 2019, the Republic of Korea reported information on its national GHG inventory for 1990–2016. This included emissions and removals of CO₂, CH₄, N₂O, HFCs, PFCs and SF₆ for all relevant sources and sinks. The inventory was developed on the basis of the Revised 1996 IPCC Guidelines, while in some cases the IPCC good practice guidance, the IPCC good practice guidance for LULUCF or the 2006 IPCC Guidelines were applied. Country-specific EFs were applied for about 80 per cent of total emissions. The total GHG emissions for 2016 were reported as 694,065.85 CO₂ Gg eq (excluding LULUCF) and 649,613.64 Gg CO₂ eq (including LULUCF). A total of 20 key categories were identified under the level assessment, and 22 were identified under the trend assessment. The energy sector accounted for 78.5 per cent of key category emissions.

95. The Republic of Korea reported information on mitigation actions and their effects in narrative format (supplemented by some information in tabular format) in the context of its emission reduction target for 2030. The Republic of Korea's nationally determined contribution includes a GHG emission reduction target of 37 per cent below the level of the 'business as usual' scenario by 2030. Currently the Republic of Korea is revising its target relative to 2017 (24.4 per cent reduction in GHG emissions by 2030 compared with the 2017 level) through the amendment of the Enforcement Decree of the Framework Act on Low Carbon Green Growth. The Party reported actions in the industrial, buildings, transportation, waste, agriculture and forestry sectors, among others. The mitigation actions focus on carbon pricing (through the KETS), energy efficiency and renewable energy. Among the actions with the greatest emission reductions were those reported for the transport sector, including an agreement on voluntary GHG reductions with the national flag-carrying airlines, which resulted in emission reductions of approximately 450,000 t CO₂ eq by 2017, and improvements to the operational efficiency of railway transportation leading to GHG emission reductions of 945,000 t CO₂ eq by 2018.

96. The Party reported the progress of implementation of most of its mitigation actions and the results achieved for some of them. Several elements required by decision 2/CP.17, annex III, paragraphs 11–13, were not reported or were not transparently reported. The Party clarified that this was due to the transition, in 2019, to a new comprehensive monitoring and evaluation framework for mitigation actions. The new framework is expected to facilitate improved reporting in relation to all requirements related to mitigation actions in the Party's next BUR.

97. The Republic of Korea did not report any information on key constraints, gaps and related needs. During the technical analysis, the Party clarified that it has sufficient capacity to enhance its means to cope with climate change. The Republic of Korea further clarified that it did not receive financial, technical or capacity-building support from developed countries, except for co-financing support from the EU via an emissions trading scheme project between the EU and the Party (2016–2018), which established systems for mutual learning and knowledge-sharing. The Party also clarified that it did not receive any external support for preparing its latest BUR and that it relies exclusively on its own financial resources for the preparation of its national reports. Information on technology needs was not reported, as the Party clarified during the technical analysis that the Ministry of Science and ICT has identified in its 2016 Climate Technology Roadmap 10 green or climate-related technologies that the Party aims to secure and for which it has been promoting related research and development. The Republic of Korea reported on the wide range of financial, technical and capacity-building support it provides to other developing countries as part of its involvement in global action against climate change.

98. The TTE, in consultation with the Republic of Korea, identified the three capacity-building needs listed in chapter II.D above and needs for capacity-building that aim to facilitate reporting in accordance with the UNFCCC reporting guidelines on BURs and participation in ICA in accordance with the ICA modalities and guidelines, taking into account Article 4, paragraph 3, of the Convention. The Republic of Korea identified the capacity-building need indicated in paragraph 88(a) above as the highest priority, followed by those identified in paragraph 88(b–c) above.

Annex I

Extent of the information reported by the Republic of Korea in its third biennial update report

Table I.1

Identification of the extent to which the elements of information on greenhouse gases are included in the third biennial update report of 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 first BUR in November 2019; the GHG inventory reported is for 1990–2016.
Decision 2/CP.17, annex III, paragraph 4	Non-Annex I Parties should use the methodologies established in the latest UNFCCC guidelines for the preparation of NCs from non-Annex I Parties approved by the Conference of the Parties or those determined by any future decision of the Conference of the Parties on this matter.	Yes	The national GHG inventory was prepared using primarily the Revised 1996 IPCC Guidelines, but for some categories, the Republic of Korea used the IPCC good practice guidance, the IPCC good practice guidance for LULUCF and the 2006 IPCC Guidelines.
Decision 2/CP.17, annex III, paragraph 5	The updates of the section on national inventories of anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol should contain updated data on activity levels based on the best information available using the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF; any change to the EF may be made in the subsequent full NC.	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 not reported, with some required elements missing (e.g. annual carbon loss due to commercial felling, annual volume of fuelwood gathering, carbon fraction of dry matter were not reported).
	(b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines.	Yes	
Decision 2/CP.17, annex III, paragraph 7	Each non-Annex I Party is encouraged to provide a consistent time series back to the years reported in its previous NCs.	Yes	
Decision 2/CP.17, annex III, paragraph 8	Non-Annex I Parties that have previously reported on their national GHG inventories contained in their NCs are encouraged to submit summary information tables of inventories for previous submission years (e.g. for 1994 and 2000).	Yes	

<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); (b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF ₆).	Yes	
Decision 2/CP.17, annex III, paragraph 10	Additional or supporting information, including sector-specific information, may be supplied in a technical annex.	NA	
Decision 17/CP.8, annex, paragraph 12	Non-Annex I Parties are also encouraged, to the extent possible, to undertake any key source analysis as indicated in the IPCC good practice guidance to assist in developing inventories that better reflect their national circumstances.	Yes	
Decision 17/CP.8, annex, paragraph 13	Non-Annex I Parties are encouraged to describe procedures and arrangements undertaken to collect and archive data for the preparation of national GHG inventories, as well as efforts to make this a continuous process, including information on the role of the institutions involved.	Yes	
Decision 17/CP.8, annex, paragraph 14	Each non-Annex I Party shall, as appropriate and to the extent possible, provide in its national inventory, on a gas-by-gas basis and in units of mass, estimates of anthropogenic emissions of: (a) CO ₂ ; (b) CH ₄ ; (c) N ₂ O.	Yes Yes Yes	
Decision 17/CP.8, annex, paragraph 15	Non-Annex I Parties are encouraged, as appropriate, to provide information on anthropogenic emissions by sources of: (a) HFCs; (b) PFCs; (c) SF ₆ .	Yes Yes Yes	
Decision 17/CP.8, annex, paragraph 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emissions by sources of other GHGs, such as: (a) CO; (b) NO _x ; (c) NMVOCs.	No No No	The Republic of Korea did not report information on CO, NO _x , NMVOC or SO _x emissions in the BUR.
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	

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 17/CP.8, annex, paragraph 18	Non-Annex I Parties are encouraged, to the extent possible, and if disaggregated data are available, to estimate and report CO ₂ fuel combustion emissions using both the sectoral and the reference approach and to explain any large differences between the two approaches.	Yes	
Decision 17/CP.8, annex, paragraph 19	Non-Annex I Parties should, to the extent possible, and if disaggregated data are available, report emissions from international aviation and marine bunker fuels separately in their inventories:		
	(a) International aviation;	Yes	
	(b) Marine bunker fuels.	Yes	
Decision 17/CP.8, annex, paragraph 20	Non-Annex I Parties wishing to report on aggregated GHG emissions and removals expressed in CO ₂ eq should use the global warming potential provided in the IPCC Second Assessment Report based on the effects of GHGs over a 100-year time-horizon.	Yes	
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	
	(b) Explanation of the sources of EFs;	Yes	
	(c) Explanation of the sources of AD;	Yes	
	(d) If non-Annex I Parties estimate anthropogenic emissions and removals from country-specific sources and/or sinks that are not part of the Revised 1996 IPCC Guidelines, they should explicitly describe:	NA	The Republic of Korea did not estimate anthropogenic 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.
	(i) Source and/or sink categories;		
	(ii) Methodologies;		
	(iii) EFs;		
	(iv) AD;		
	(e) Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building.	No	

<i>Decision</i>	<i>Provision of the reporting guidelines</i>	<i>Assessment of whether the information was reported</i>	<i>Comments on the extent of the information provided</i>
Decision 17/CP.8, annex, paragraph 22	Each non-Annex I Party is encouraged to use tables 1 and 2 of the guidelines annexed to decision 17/CP.8 in reporting its national GHG inventory, taking into account the provisions established in paragraphs 14–17. In preparing those tables, Parties should strive to present information that is as complete as possible. Where numerical data are not provided, Parties should use the notation keys as indicated.	Yes	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:		
	(a) Level of uncertainty associated with inventory data;	No	
	(b) Underlying assumptions;	No	
	(c) Methodologies used, if any, for estimating these uncertainties.	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 third 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 removals by sinks of all GHGs not controlled by the Montreal Protocol.	Partly	The Party reported mitigation actions primarily in a narrative format for the KETS, the GHG and Energy Target Management System and the energy transformation, industrial, buildings, transportation, waste, agriculture and livestock, and forestry sectors, and the public sector and other sectors. The narrative reporting included some information presented in tabular format.
Decision 2/CP.17, annex III, paragraph 12	For each mitigation action or group of mitigation actions, including, as appropriate, those listed in document FCCC/AWGLCA/2011/INF.1, developing country Parties shall provide the following information, to the extent possible:		
	(a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indicators;	Partly	The Party provided names and descriptions of all its mitigation actions or groups of actions. Information on the coverage of gases, quantitative goals and

<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>
			progress indicators was not reported for most of the mitigation actions.
	(b) Information on:		
	(i) Methodologies;	Partly	With the exception of the energy transformation sector, information on methodologies was not reported.
	(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;	Partly	For most of its mitigation actions, the Republic of Korea did not systematically describe the status of implementation.
	(ii) Progress of implementation of the underlying steps taken or envisaged;	No	
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Partly	The Party did not report on estimated emission reductions for most of its mitigation actions.
	(e) Information on international market mechanisms.	No	
Decision 2/CP.17, annex III, paragraph 13	Parties should provide information on domestic MRV arrangements.	No	

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

Table I.3

Identification of the extent to which the elements of information on finance, technology and capacity-building needs and support received are included in the third biennial update report of 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	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.
	(b) Related financial, technical and capacity-building needs.	No	During the technical analysis, the Republic of Korea clarified that it did not identify any financial, technical or capacity-building needs because its needs can be met with its own resources.

<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, Non-Annex I Parties should provide: annex III, paragraph 15	(a) Information on financial resources received, technology transfer and capacity-building received;	Partly	The Republic of Korea reported information on support received from the EU; however, it was not clear whether or not this was the only support received.
	(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	During the technical analysis, the Republic of Korea clarified that it did not receive any support.
Decision 2/CP.17, With regard to the development and transfer of technology, non-Annex I Parties should provide information on: annex III, paragraph 16	(a) Nationally determined technology needs;	No	During the technical analysis, the Republic of Korea clarified that it has identified in its 2016 Climate Technology Roadmap 10 green or climate-related technologies that it aims to secure and on which it is promoting research and development; however, these technologies were not reported in the BUR.
	(b) Technology support received.	No	During the technical analysis, the Republic of Korea clarified that it did not receive any technology support.

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

Annex II

Reference documents

A. Reports of the Intergovernmental Panel on Climate Change

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

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

IPCC. 2003. *Good Practice Guidance for Land Use, Land-Use Change and Forestry*. J Penman, M Gytarsky, T Hiraishi, et al. (eds.). Hayama, Japan: Institute for Global Environmental Strategies. Available at <http://www.ipcc-nggip.iges.or.jp/public/gp/lulucf/gp/lulucf.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 and second BURs of the Republic of Korea. Available at <https://unfccc.int/ICA-reports>.