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Technical analysis of the second biennial update report of Thailand submitted on 29 December 2017

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 (non-Annex I Parties), consistently with their capabilities and the level of support provided for reporting, were to submit their first biennial update report (BUR) by December 2014. Further, 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 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 BURs at their discretion. This summary report presents the results of the technical analysis of the second BUR of Thailand conducted by a team of technical experts in accordance with the modalities and procedures contained in the annex to decision 20/CP.19.

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Contents

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AD	activity data
BUR	biennial update report
CGE	Consultative Group of Experts on National Communications from Parties not included in Annex I to the Convention
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
EF	emission factor
GDP	gross domestic product
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
ICA	international consultation and analysis
IPCC	Intergovernmental Panel on Climate Change
IPCC good practice guidance	*Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories*
IPCC good practice guidance for LULUCF	*Good Practice Guidance for Land Use, Land-Use Change and Forestry*
IPPU	industrial processes and product use
LULUCF	land use, land-use change and forestry
MRV	measurement, reporting and verification
N_2O	nitrous oxide
NA	not applicable
NAMA	nationally appropriate mitigation action
NC	national communication
NCCC	National Committee on Climate Change Policy
NDC	nationally determined contribution
NE	not estimated
NIR	national inventory report
NMVOC	non-methane volatile organic compound
NO	not occurring
NOx	nitrogen oxides
non-Annex I Parties	Parties not included in Annex I to the Convention
ONEP	Office of Natural Resources and Environment Policy and Planning
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
Revised 1996 IPCC Guidelines	*Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*
SF_6	sulfur hexafluoride
SO_2	sulfur dioxide
TTE	team of technical experts
UNDP	United Nations Development Programme
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 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 BURs. 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. Thailand submitted its first BUR on 29 December 2015, which was analysed by a TTE in the fifth round of technical analysis of BURs from non-Annex I Parties, conducted from 13 to 17 June 2016. After the publication of its summary report, Thailand participated in the third workshop for the facilitative sharing of views, convened in Bonn, Germany, on 15 May 2017.

5. This summary report presents the results of the technical analysis of the second BUR of Thailand 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. Thailand submitted its second BUR on 29 December 2017, which is within two years since the submission of the first BUR.

7. The technical analysis of the BUR took place from 3 to 9 March 2018 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: Ms. Selam Abebe (former member of the CGE from Ethiopia), Mr. Oluseyi Adefisan (member of the CGE from Nigeria), Mr. Takeshi Enoki (former member of the CGE from Japan), Ms. Olga Gavrilova (Estonia), Ms. Valentina Idrissova (Kazakhstan), Ms. Neranda Maurice-George (Saint Lucia), Mr. John Steller (United States of America) and Mr. Daniel Tutu Benefoh (Ghana). Ms. Abebe and Mr. Enoki were the co-leads. The technical analysis was coordinated by Ms. Karen Ortega and Ms. Marion Vieweg-Mersmann (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 Thailand engaged in consultation[1] on the identification of capacity-building needs for the preparation of BURs and participation in the ICA process. Following the technical analysis of Thailand's second BUR, the TTE prepared and shared a draft summary report with Thailand on 30 May 2018 for its review and comment. Thailand, in turn, provided its feedback on the draft summary report on 9 August 2018.

9. The TTE responded to and incorporated the Party's comments referred to in paragraph 8 above and finalized the summary report in consultation with Thailand on 11 October 2018.

[1] The consultation was conducted via teleconferencing.

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 chapter 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 chapter 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 chapter II.D below).

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

B. Extent of 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, the associated methodologies and assumptions, and the progress made 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 annex I.

14. The TTE notes improvements in the reporting in the second BUR compared with the first BUR. Information on GHG inventories and on mitigation actions and their effects reported in the second BUR demonstrates that the Party has taken into consideration the areas for enhanced transparency noted by the TTE in the summary report on the technical analysis of the first BUR of Thailand. These include transparency of reporting on: uncertainty, key categories and sectoral tables; progress in meeting the 2020 target; and the domestic MRV arrangements of mitigation actions that may fall outside the scope of the NAMA Roadmap. The areas for enhanced transparency noted by the TTE in the summary report on the technical analysis of the first BUR that were not addressed in the second BUR were identified by Thailand as areas for enhancing national capacity.

C. Technical analysis of the information reported

15. The technical analysis referred to in paragraph 10(b) above aims to increase the transparency of mitigation actions and their effects, without engaging in a discussion on the appropriateness of those actions. Accordingly, the technical analysis focused 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.

19. In accordance with decision 17/CP.8, annex, paragraph 3, Thailand reported in its first BUR information on national circumstances. In the second BUR, Thailand provided an update of its national circumstances, including: a description of national and regional development priorities, objectives and circumstances, including information on features of geography and climate and on the observed impacts of climate change, such as increased average temperature and adverse effects on the economy, energy systems, air and water quality, and waste, which may affect the Party's ability to deal with mitigating and adapting to climate change; and information regarding national circumstances and constraints on meeting 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, in Article 4, paragraphs 9 and 10, of the Convention.

20. In addition, as encouraged in decision 17/CP.8, annex, paragraph 4, Thailand provided a summary of relevant information regarding its national circumstances in tabular format and using graphs. This information describes, in particular: the geography, climate conditions and climate scenarios; natural resources, including water; the state of the environment; rural and urban population changes; the structure of the population and changes in that structure; energy; and the current state of the national economy and changes witnessed in the economic base. The trends of increasing average temperature and increasing maximum and minimum temperatures reported in the first BUR have continued. The second BUR also reports population projections up to 2030, which indicate total population will grow by only about one million people (or 1.6 per cent) compared with the population figure from the 2010 census. The transportation and industrial sectors are the largest energy consumers in Thailand. About 18 per cent of energy consumption comes from renewable sources (traditional and new), while the non-renewable component of energy consumed is dominated by petroleum products and electricity.

21. Thailand reported that the country has experienced low (single digit) GDP growth in the past decade; GDP fell from 7.2 per cent in 2012 to 0.8 per cent in 2014 and recovered to 2.9 per cent in 2015. The industrial and service sectors are the main drivers of recent growth. The economy is heavily export-dependent, with exports accounting for more than one third of economic activity in recent years. However, both exports and imports have faced negative growth over the past few years. The country is promoting the "New S-Curve" industries such as robotics, aviation and logistics, biofuels and biochemical, the digital industry, and the medical hub. In recent years, Thailand's balance of payments has averaged approximately USD 5 billion, with total debt outstanding being between USD 130 and 140 billion. GDP per capita has increased slightly since 2012, reaching USD 4,362 in 2015. Thailand has one of the world's lowest unemployment rates, at about 1 per cent. The poverty rate declined from 13.2 per cent in 2011 to 7.2 per cent in 2015.

22. Thailand transparently described in its BUR the existing institutional arrangements relevant to the preparation of its NCs and BURs on a continuous basis. The description covers key aspects of the institutional arrangements. In Thailand, ONEP is the coordinating entity for the preparation of BURs. ONEP serves as the secretariat of NCCC. The Government of Thailand established NCCC, which is chaired by the Prime Minister and is responsible for:

(1) national climate change policy and strategy; (2) determining the national position in international negotiations under the Convention and any other relevant international agreements; and (3) monitoring and evaluating the results of the implementation of national policies and strategies by government agencies. The structure of NCCC is also reported in the BUR, including its four subcommittees: the Climate Change Policy and Planning Integration Subcommittee; the Climate Change Knowledge and Database Subcommittee; the Climate Change Negotiation and International Cooperation Subcommittee; and the Action for Climate Empowerment and Public Relations Subcommittee.

23. Thailand reported in its BUR on the institutional arrangements specific to the preparation of GHG inventories as part of the overall arrangements for the preparation of NCs and BURs. NCCC is the governmental body responsible for climate change policies and ONEP is the national focal point for GHG inventory preparation. In 2015 ONEP established a GHG inventory system that will be ready to use for GHG emission estimation for the next BUR and will also serve for archiving the GHG emission data of Thailand. The system involves local government and private sector data collection, QC of the estimates by the lead agencies in each sector (five working groups with members from agencies in five sectors) and calculation of GHG emission estimates by ONEP. When the draft BUR is ready, ONEP will hold a public hearing as part of the public inquiry process and then submit the BUR to the Climate Change Knowledge and Database Subcommittee for verification (QA) before final approval by NCCC. The Australian Department of Environment and Energy assisted Thailand in designing its GHG inventory database system.

24. The TTE noted that in Thailand's BUR, the information reported on the institutional arrangements for the preparation and submission of NCs and BURs on a continuous basis identifies the coordination institution and the other agencies involved in the process. The TTE noted that additional information on the roles of each of the agencies involved in the reporting of the BUR could improve the transparency of and enable the TTE to better understand the information reported.

25. In paragraph 25 of the summary report on the technical analysis of Thailand's first BUR, the TTE noted areas where the transparency of the reporting on institutional arrangements could be further enhanced. The present TTE noted that Thailand included relevant information in its second BUR, and the TTE commends the Party for enhancing the transparency of its reporting.

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

26. As indicated in table 1 in annex I, Thailand 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 "Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention", contained in the annex to decision 17/CP.8.

27. Thailand submitted its second BUR in 2017 and the GHG inventory is for the year 2013, which is consistent with the provision for the reporting time frame.

28. GHG emissions and removals for the BUR submission covering the year 2013 were estimated using tier 1 and, where data were available, tier 2 methodologies from the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF, as appropriate.

29. With regard to the methodologies used, information was reported in table 2-1 of Thailand's BUR, including sources of AD and methodological tiers used for each category and subcategory. Tier 1 methodologies and default EFs were used for the energy and industrial processes sectors. Tier 1 and tier 2 methodologies, as well as a combination of country-specific and default EFs, were used for the waste, agriculture and LULUCF sectors. Specifically, tier 2 methodologies were used for: 4.A enteric fermentation, 4.B manure management, 4.C rice cultivation, 4.F field burning of crop residues, 5.A changes in forest and other woody biomass stocks, 5.B forest and grassland conversion, 5.C abandonment of managed lands, 6.A solid waste disposal on land and 6.C waste incineration. The TTE noted that updated values of AD and country-specific EFs were not reported in the BUR. During the technical analysis, Thailand provided additional information on the methodologies and

data utilized to calculate emissions and country-specific EFs for the agriculture sector. Thailand noted that updated AD will be included in the next NC.

30. The total GHG emissions for 2013 reported in Thailand's BUR, including and excluding LULUCF, amounted to 232,560 and 318,662 Gg CO_2 eq, respectively, an increase of 8.6 and 40.9 per cent, respectively, since 2000 (214,091 Gg CO_2 eq and 226,086 Gg CO_2 eq, respectively). The GHG emissions excluding LULUCF reported for 2013 comprise 242,022.62 Gg CO_2, 59,520.34 Gg CO_2 eq CH_4 and 17,119.20 Gg CO_2 eq N_2O. Thailand did not report emissions of HFCs, PFCs and SF_6. During the technical analysis, Thailand clarified that emissions of fluorinated gases were not reported because of data limitations but that it is developing the GHG inventory systems to address these emissions.

31. Other emissions reported are 1,351 Gg NOx, 7,037 Gg CO, 828 Gg NMVOCs, and 573 Gg SO_2 for 2013.

32. Thailand applied notation keys in table 2-5 of its BUR, as well as in the sectoral reporting tables, where numerical data were not provided. In addition, the notation key "NE" was reported for some categories without providing a corresponding explanation (e.g. for CO_2 emissions and removals from category 5.D CO_2 emissions and removals from soils).

33. Thailand did not report comparable information addressing the tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF. During the technical analysis, Thailand noted that it is currently developing a geographic information system database system for land-use representation to facilitate reporting in tables similar to annex 3A.2.

34. Thailand reported comparable information in aggregate form addressing the land-use change and forestry (referred to in the BUR as LULUCF) and agriculture sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines. Thailand also reported comparable information for all other sectors addressing the sectoral reporting tables annexed to the Revised 1996 IPCC Guidelines. During the technical analysis, Thailand provided additional information to disaggregate the sectoral reporting tables for the agriculture sector, including emissions reported by animal type for enteric fermentation and manure management.

35. The shares of emissions that different sectors contributed to the total GHG emissions excluding LULUCF in 2013 are: energy, 74.3 per cent; industrial processes, 6.0 per cent; agriculture, 16.0 per cent; and waste, 3.7 per cent (figure 2-2 of the BUR). LULUCF was responsible for removals of 86,101.84 Gg CO_2 eq.

36. GHG emissions in 2013 from the energy sector amounted to 236,936.48 Gg CO_2 eq. The key category analysis identified seven key categories within the energy sector (e.g. CO_2 from public electricity and heat production, CO_2 from road transportation, CO_2 from manufacturing industries and construction). Information is reported in chapter 1.2 of Thailand's BUR on energy consumption and energy production but not on the fuel types in the energy categories of the GHG inventory.

37. Industrial process emissions amounted to 18,967.79 Gg CO_2 eq, reported from source categories 2.A mineral products, 2.B chemical industry and 2C metal production. The key category analysis identified CO_2 from mineral products as a key category, largely owing to emissions from cement production. The TTE noted that Thailand did not provide any information regarding production in various industries (e.g. ammonia production, lime production, ferroalloys production) in its BUR. The Party clarified that information on emissions from ammonia production was not provided because there are no ammonia production plants in Thailand. The Party is currently developing the methodology for collecting AD from other industries.

38. For the agriculture sector, Thailand reported GHG emissions of 50,919.34 Gg CO_2 eq, with N_2O from agricultural soils and CH_4 from enteric fermentation and rice cultivation being identified as key categories and the most relevant emission sources in the sector. Thailand used both default EFs from the Revised 1996 IPCC Guidelines and the IPCC good practice guidance and country-specific EFs for the agriculture sector. During the technical analysis, Thailand provided additional information on the sources of AD, EFs, methodologies and uncertainty for the sector, as well as disaggregated sectoral tables. The TTE noted that the additional disaggregated information provided by Thailand enabled the TTE to gain a better understanding of CH_4 emissions from enteric fermentation as a key category.

39. For the LULUCF sector, Thailand reported GHG emissions and removals for 2000–2013 in the BUR (table 2-6). The key category analysis identified as key categories CO_2 from changes in forest and other woody biomass stocks, CO_2 from abandonment of managed lands and CO_2 from forest and grassland conversion. Overall, the net removals from the LULUCF sector fluctuated between a minimum of 7,718 CO_2 eq in 2001 and a maximum of 86,102 CO_2 eq in 2013. Across the 2000–2013 time series, LULUCF contributed to net removals. Thailand provided information on the reason for increased removals following 2005, which was that, at that time, rubber plantations were included in the calculations.

40. For the waste sector, Thailand reported emissions of 11,829.56 Gg CO_2 eq, with CH_4 from solid waste disposal on land and from wastewater handling being identified as key categories. Thailand used both default and country-specific EFs to calculate emissions in the waste sector.

41. Thailand included in its BUR an NIR containing information on an update of its first BUR, which addressed anthropogenic emissions and removals for 2011. The update was carried out for all years in the period 2000–2013 using the methodologies contained in the Revised 1996 IPCC Guidelines, thus generating a consistent 14-year time series. During the technical analysis, Thailand noted that for the year 1994, which was included in its NC1 and NC2, historical data were not available to recalculate emission estimates for this year in the time series. The development of Thailand's centralized database system may help to address the challenge of recalculations based on historical data. The previous national inventory, from 2000–2011, was prepared using default EFs from the Revised 1996 IPCC Guidelines, the IPCC good practice guidance, the IPCC good practice guidance for LULUCF and the 2006 IPCC Guidelines.

42. Thailand reported a key category analysis performed for both the level of and the trend in emissions, which identified 16 key categories. The BUR also provides information on QA/QC measures for inventory preparation. The TTE commends Thailand for reporting information on the key category analysis and QA/QC (as part of the institutional arrangements) in the BUR.

43. Thailand reported information on CO_2 from fuel combustion using only the sectoral approach. During the technical analysis, the Party clarified that information on CO_2 from fuel combustion for both the sectoral and the reference approach was included in the BUR, but only in the Thai language version.

44. Information on international aviation and marine bunker fuels was reported as "NA". During the technical analysis, Thailand clarified that this information was not available but, in 2017, the Party began collecting data on fuel combustion from international aviation as part of the International Civil Aviation Organization and International Maritime Organization requirements. These data will allow Thailand to report emissions from international aviation in future BURs. The Party also clarified that for marine bunker fuels, the only available information is for domestic waterborne navigation.

45. Thailand reported information on its use of GWP values, which are consistent with those provided by the IPCC in its Second Assessment Report based on the effects of GHGs.

46. Thailand reported information on the uncertainty assessment (level) of its national GHG inventory in its BUR (p.29). The uncertainty analysis is based on the tier 1 approach and covers all source categories and all direct GHGs. The aggregated results, as reported in the BUR, reveal that the uncertainty level for emissions is 29.3 per cent (5.5 per cent excluding LULUCF). During the technical analysis, Thailand provided additional detailed information on the uncertainty values of AD and EFs for the agriculture sector, and clarified the underlying assumptions used for the uncertainty assessment. The TTE commends Thailand for reporting information on the uncertainty assessment in its BUR.

47. Thailand reported information on constraints, gaps and needs in the national GHG inventory in its BUR (chapter 2.4). In addition, Thailand reported on improvements made since the first BUR. All the information is reported by specific GHG inventory sector. The TTE commends Thailand for providing in its BUR information on improvements, constraints, gaps and needs.

48. The TTE noted that the transparency of the information reported could be enhanced by addressing the areas noted by the TTE in paragraphs 29, 30, 32, 33, 34, 36, 37, 38, 41, 44, 45 and 47 above, which could enable the TTE to better understand the information reported.

49. In paragraphs 31, 33, 35, 36 and 44 of the summary report on the technical analysis of Thailand's first BUR, the TTE noted where the transparency of reporting on country-specific EFs, uncertainty and key categories and of sectoral reporting tables could be enhanced. The present TTE noted that Thailand took into consideration these areas of improvement in its second BUR and commends the Party for enhancing the transparency of the information reported.

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

50. As indicated in table 2 in annex I, Thailand 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. All of the mitigation actions reported were for the energy sector, with renewable energy, transportation, energy efficiency, and standards and labelling being the broad areas of action.

51. The information reported provides an overview of Thailand's mitigation actions and their effects, including national context. In its BUR, Thailand explains that the Nationally Determined Contribution Roadmap on Mitigation 2021–2030 was approved in May 2017, and is based on relevant national plans already approved or in the pipeline for approval by the Cabinet. Thailand frames its national mitigation planning and actions in the context of the Alternative Energy Development Plan, the Power Development Plan and the Energy Efficiency Plan. Thailand reported that climate change has been mainstreamed in and integrated into its development plans, such as the 12th National Economic and Social Development Plan 2017–2021. The mitigation actions implemented up to 2016 have contributed to estimated emission reductions of 7 per cent compared with the 'business as usual' scenario, which means that Thailand has already attained its 2020 target, four years ahead of schedule. Thailand reported that its submitted NDC of a 20 per cent emission reduction by 2030 could be further increased to 25 per cent compared with the 'business as usual' scenario by 2030, provided adequate and enhanced access to technology development and transfer, capacity-building and financial resources are available.

52. Thailand reported a summary of its mitigation actions in tabular format. Consistently with decision 2/CP.17, annex III, paragraph 12(a), Thailand reported the names of groups of actions, coverage (e.g. sector, energy and transport; gas coverage, CO_2,) and progress indicators of its implemented measures in table 3-2 of its BUR. During the technical analysis, Thailand clarified that the summary information on Thailand's mitigation measures contained in table 3.1 of the BUR related to its planned mitigation actions in the energy, industrial processes and waste sectors. The implemented mitigation actions reported in table 3.2 were as follows:

(a) Electricity generation from renewable energy (solar, biomass, biogas);

(b) Heat generation from renewable energy (solar, biomass, biogas);

(c) Biodiesel consumption in transport;

(d) Ethanol consumption in transport;

(e) Energy efficiency improvements to power plants (thermal plants, clean technology plants);

(f) Energy efficiency standards and labelling for electric equipment.

53. Outcomes of mitigation actions for 2013, 2014 and 2015 were reported in the BUR (table 3-2), although for some actions not all years were reported. Thailand reported unavailability of a methodology ("n/a") or unavailability of a tracking process ("n/t") for some mitigation actions for 2013 and 2014, and for measures where mitigation effects were reported for other years. The Party clarified during the technical analysis that four mitigation measures in table 3-2 ("Heat generation from natural renewable energy (solar)", "Heat generation from bio-renewable energy (biomass and biogas)", "Energy efficiency

improvement by clean technology power plant" and "Energy efficiency standard and labeling for the electric equipment") were the new measures for the GHG reduction reported in the BUR. Thailand provided further clarity concerning the challenges it faced in providing the information reported for the period 2013–2015 in its BUR. These challenges included: lack of a GHG reduction estimation methodology for actions reported as "n/a"; determining the best approach to reporting; and verifying data to satisfy the criteria for the entire tracking process.

54. The underlying assumptions of the mitigation actions were not reported by Thailand as required by decision 2/CP.17, annex III, paragraph 12(b)(ii). The TTE noted that the transparency of Thailand's future BURs could be improved by providing information on its underlying assumptions.

55. The objectives of the mitigation actions were reported in the BUR under the "Targets" column in table 3.2 for some of Thailand's mitigation actions. During the technical analysis, the Party indicated that objectives for the remaining measures are available, because they are already included in the Alternative Energy Development Plan 2015–2036. The TTE noted that Thailand could enhance the transparency of its next BUR by including more information to enhance the description of the objectives of the mitigation actions.

56. Information on the progress of implementation of the mitigation actions was reported. Thailand reported that its mitigation measures were derived from projects that are implemented. It reported total emission reductions of 14.37 Mt CO_2 eq for 2013, 37.47 Mt CO_2 eq for 2014 and 40.14 Mt CO_2 eq for 2015. However, information on the steps taken to implement the mitigation actions was not reported by measure and only a brief overall summary was provided. During the technical analysis, Thailand explained that such information is available, but only a brief explanation could be included in the BUR because of time constraints. The TTE noted that Thailand could improve the transparency of its next BUR by providing more detailed information on the underlying steps taken or envisaged to implement its mitigation measures.

57. Thailand did not provide information on its involvement in international market mechanisms. During the technical analysis, the Party explained that it is part of the Joint Crediting Mechanism, which is operated in collaboration with Japan. Thailand is currently preparing for carbon pricing instruments to scale up mitigation efforts. It also stated that the information on international markets would be included in its NC3. The TTE is of the view that the transparency of Thailand's next BUR could be improved by providing information on international market mechanisms, because Thailand is a Party to the Kyoto Protocol.

58. Thailand has reported information on its domestic MRV arrangements consistently with decision 2/CP.17, annex III, paragraph 13. The MRV system was developed to monitor progress in the implementation of the NAMA Roadmap. The information reported indicates that Thailand has updated its MRV system to improve its structure. The improvements include: emission measurements at the plant level; reporting by plant authorities to corresponding authorities such as the regulatory commission; and verification by authorized agencies. During the technical analysis, Thailand provided further information on its development of the Thailand Greenhouse Gas Emissions Inventory System for GHG estimation and data archiving as well as a template for data collection, and indicated it has already trained relevant agencies for the MRV process. The TTE noted that providing this additional information on improvements in its MRV system would further enhance the transparency of Thailand's next BUR.

59. In paragraph 55 of the summary report on the technical analysis of Thailand's first BUR, the TTE noted where the transparency of reporting on progress in meeting the Party's 2020 target could be further enhanced. The present TTE noted that Thailand took into consideration this area of improvement by providing this information in its BUR (p.51, first paragraph) and commends the Party for enhancing the transparency of the information reported.

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

60. As indicated in table 3 in annex I, Thailand reported in its BUR, completely in accordance with paragraphs 14–16 of the UNFCCC reporting guidelines on BURs, information on finance, technology and capacity-building needs and support received, as detailed in paragraphs 61–64 below.

61. Thailand reported on constraints, gaps and related financial, technical and capacity-building needs. It noted key barriers related to mitigation efforts, research and databases, and GHG inventory estimation and compilation. During the technical analysis, Thailand informed the TTE that it received support for designing a system for preparing GHG inventories from the Australian Government (see para. 23 above). The Party noted key barriers to maintain observation sites such as AERONET and FLUXNET – these are maintained by research institutions and universities that are reliant on the availability of funding. Thailand reported capacity barriers with regard to: new issues emerging from the Paris Agreement; green growth education; and business models for renewable energy. It also reported on constraints related to the methodologies for tracking the NAMA Roadmap and NDCs.

62. Thailand reported on technology needs for mitigation and adaptation efforts, and concluded that mitigation technology is needed for mitigating GHG emissions, climate modelling, early warning systems and energy-efficient technologies. The Party has further prioritized adaptation technology needs in three sectors, namely, agriculture, water resource management and modelling.

63. In relation to capacity-building needs, Thailand reported the need for capacity-building for personnel to operate and maintain the observation sites for meteorological, atmospheric and oceanic variables.

64. Thailand also reported that it needs assistance to carry out improvements in the quality of its inventory in the areas of national statistics and reporting of AD by the relevant agencies.

65. Thailand reported on technology and financial needs relating to climate change adaptation, as detailed in paragraphs 66–69 below.

66. In agriculture, three groups of technology needs for adaptation were identified, namely, forecasting and early warning systems, crop improvement for climate resilience (marker-assisted selection and genetic engineering) and precision farming technologies.

67. In water resources management, high-impact technologies were prioritized, including networking (via pipes or canals), management of infrastructure (including zoning), seasonal climate prediction as part of weather and hydrological modelling, and observation and modelling data as part of an early warning system.

68. The national data centre transfer and management process and integrated modelling (weather research and forecasting and advanced research weather research and forecasting) were reported as needs related to modelling.

69. Regarding resilience, the financial needs for implementing the Building Climate Change Resilient Coastal Communities and Ecosystems in Asia project and for maximizing the potential of coastal ecosystems to store carbon were reported.

70. Thailand reported that it received USD 852,000 from the Global Environment Facility, which included the allocation for both its first BUR and its NC3 and additional USD 352,000 for the preparation of the second BUR. Counterpart support was provided by the Royal Thai Government through in-kind contributions amounting to USD 700,000 for the first BUR and NC3 and USD 100,000 for the second BUR for fulfilling Thailand's reporting obligations under the Convention. Thailand reported information on support received from international organizations and agencies for climate change activities, including financial support, and support for capacity-building, technology transfer, and mitigation and adaptation efforts. Detailed information is reported in table 4.3 of the BUR. The TTE commends Thailand for the information provided with regard to support needs and support received.

71. Thailand received capacity-building and technical support from various sources, including training on using the 2006 IPCC Guidelines to prepare its GHG inventory (funded by the United States Agency for International Development) and funding for participation in workshops on GHG inventories to improve the accuracy of the information reported (funded by Japan through the Workshop on Greenhouse Gas Inventories in Asia series). The BUR includes information on the technical support received for developing a clear road map for GHG reduction in three selected areas, namely, palm oil production, frozen foods and automotive parts. The BUR also reports on technical support received for the development of the NDC Action Plan for the Thai industrial sector, which focuses on GHG reductions from energy.

72. In addition, Thailand received support for the following projects, among others: Strengthening Thailand's Capacity to Link Climate Policy Finance 2013–2017 (provided by UNDP with partial support provided by the Swedish International Development Agency); achieving low-carbon growth in cities through the Sustainable Urban Systems Management project (provided by UNDP through Global Environment Facility funding); Low Emission Capacity Building (provided by the European Union, the German Ministry of Environment, Nature, Conservation and Nuclear Safety, and the Australian Government through UNDP support).

D. Identification of capacity-building needs

73. In consultation with Thailand, the TTE identified the following capacity-building needs related to the facilitation of the preparation of subsequent BURs and participation in ICA:

(a) Needs with regard to the GHG inventory:

(i) Training technical staff and national experts to use the 2006 IPCC Guidelines, particularly for undertaking data collection and data processing for the agriculture, forestry and other land use sector and the IPPU sector;

(ii) Further enhancing the methods of collecting disaggregated data from sectoral subcategories, particularly for new industries in the IPPU sector, for use with the 2006 IPCC Guidelines;

(iii) Strengthening existing institutional arrangements to improve data collection of national statistics from relevant agencies and the private sector;

(iv) Enhancing processes for data collection, emission calculations and reporting on emissions of HFCs, PFCs and SF_6;

(v) Developing country-specific uncertainty values for AD and EFs and additional country-specific EFs, particularly for key categories;

(b) Needs with regard to mitigation:

(i) Further enhancing the capacity to report information on the status of actions and funding for measures to better understand the progress of implementation;

(ii) Further enhancing the capacity to report on the progress and underlying steps taken or envisaged;

(iii) Further enhancing the capacity to improve transparency by providing additional information on outcomes, such as sustainable development effects, economic and social consequences of the implementation of response measures and interaction of policies and actions;

(c) Needs related to reporting cross-cutting issues: Strengthening institutional and human capacities for the fulfilment of reporting obligations on a continuous basis.

74. The TTE noted that, in addition to those needs identified during the technical analysis, Thailand reported several capacity-building needs in chapter 2.4 and table 4-1 of the BUR, covering the following areas:

(a) GHG inventory preparation;

(b) Implementation of climate actions;

(c) Adaptation to climate change.

75. In paragraph 63 of the summary report on the technical analysis of Thailand's first BUR, the TTE, in consultation with Thailand, identified capacity-building needs with regard to the GHG inventory, most of which are no longer considered capacity-building needs, with the exception of transitioning to using the 2006 IPCC Guidelines.

III. Conclusions

76. The TTE conducted a technical analysis of the information reported in the second BUR of Thailand in accordance with the UNFCCC reporting guidelines on BURs. The TTE concludes that the reported information is mostly consistent with the UNFCCC reporting guidelines on BURs and 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 removal by sinks of all GHGs not controlled by the Montreal Protocol, including an NIR; mitigation actions and their effects, including associated methodologies and assumptions; constraints and gaps and related financial, technical and capacity-building needs, including a description of support needed and received; the level of support received to enable the preparation and submission of BURs; and domestic MRV. During the technical analysis, additional information was provided by Thailand on the methodology used for estimating emissions from the agriculture sector, a summary table of emissions from the agriculture and waste sectors, and methodologies used for mitigation actions. The TTE concluded that the information analysed is mostly transparent.

77. Thailand reported information on the institutional arrangements relevant to the preparation of BURs. It has taken significant steps to create institutional arrangements that allow for the sustainable preparation of BURs, such as organizational improvements and knowledge-sharing procedures to facilitate sectoral information transfer. The TTE commends Thailand for the progress made and noted that the plans to improve the overall MRV system of GHG emissions and reductions, as outlined in its BUR, would contribute to achieving sustainable reporting to the secretariat.

78. In its second BUR, submitted in 2017, Thailand reported information on its national GHG inventory for 2013. This included GHG emissions and removals of CO_2, CH_4 and N_2O for all relevant sources and sinks as well as the precursor gases. Estimates of fluorinated gases were not provided owing to difficulties in obtaining the necessary data, as clarified by the Party during the technical analysis. The inventory was developed on the basis of the Revised 1996 IPCC Guidelines, the IPCC good practice guidance and the IPCC good practice guidance for LULUCF, as well as country-specific EF values wherever available. The total GHG emissions for 2013 were reported as 318,662 Gg CO_2 eq (excluding LULUCF) and 232,560 Gg CO_2 eq (including LULUCF). Sixteen key categories were identified, with CO_2 and public electricity and heat production identified as the main gas and key category, respectively.

79. Thailand reported information on mitigation actions and their effects, including the mitigation goal of a 25 per cent reduction compared with the 'business as usual' scenario by 2030. The mitigation actions were categorized in the context of groups of actions in the energy sector and GHG emission reductions of 7 per cent compared with the 'business as usual' scenario were reported for 2016. The following GHG emission reductions were reported for the energy sector: 14.34 Gg CO_2 eq for 2013; 37.47 Gg CO_2 eq for 2014; and 40.14 Gg CO_2 eq for 2015.

80. Thailand reported information on key constraints, gaps and related needs. The BUR includes an annex that clearly identifies the needs related to the development of the national GHG inventory. Information on support received and needed was reported in detail in the annex. Information on technology needs and technology needed and received was also reported in the BUR.

81. The TTE, in consultation with Thailand, identified nine 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.

Annex I

Extent of the information reported by Thailand in its second biennial update report

Table 1
Identification of the extent to which the elements of information on greenhouse gases are included in the second biennial update report of Thailand

Decision	*Provision of the reporting guidelines*	*Yes/partly/ no/NA*	*Comments on the extent of the information provided*
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	Thailand submitted its second BUR in 2017 and the GHG inventory is for the year 2013.
Decision 2/CP.17, annex III, paragraph 3	Non-Annex I Parties should submit updates of national GHG inventories according to paragraphs 8–24 in the "Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention" as contained in the annex to decision 17/CP.8.	Yes	Thailand used the Revised 1996 IPCC Guidelines.
Decision 2/CP.17, annex III, paragraph 5	The updates of the sections on the 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	
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) Tables included in annex 3A.2 to the IPCC good practice guidance for LULUCF;	No	
	(b) The sectoral report tables annexed to the Revised 1996 IPCC Guidelines.	Yes	Sectoral report tables are included in Thailand's BUR, but at an aggregated level for some sectors.
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 the previous NCs.	Partly	Thailand reported a consistent time series from 2000 to 2013. Although emissions in the year 1994 were reported in NC1 and NC2, they were not reported in the BUR because historical data were not available to enable recalculation.

Decision	*Provision of the reporting guidelines*	*Yes/partly/ no/NA*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 8	Non-Annex I Parties that have previously reported on their national GHG inventories contained in their national communications are encouraged to submit summary information tables of inventories for previous submission years (e.g. for 1994 and 2000).	Partly	Thailand did not report the year 1994, although it was included in its first and second NCs.
Decision 2/CP.17, annex III, paragraph 9	The inventory section of the BUR should consist of a national inventory report as a summary or as an update of the information contained in decision 17/CP.8, annex, chapter III (National greenhouse gas inventories), including:		
	(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	
	(b) Table 2 (National greenhouse gas inventory of anthropogenic emissions of HFCs, PFCs and SF_6).	No	
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 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	Institutional arrangements and procedures are described in chapter 1.6 of Thailand's BUR.
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;	Yes	
	(b) CH_4;	Yes	
	(c) N_2O.	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;	No	
	(b) PFCs;	No	
	(c) SF_6.	No	
Decision 17/CP.8, annex, paragraph 16	Non-Annex I Parties are encouraged, as appropriate, to report on anthropogenic emission by sources of other GHGs, such as:		
	(a) CO;	Yes	
	(b) NOx;	Yes	
	(c) NMVOCs.	Yes	

Decision	*Provision of the reporting guidelines*	*Yes/partly/ no/NA*	*Comments on the extent of the information provided*
Decision 17/CP.8, annex, paragraph 17	Other gases not controlled by the Montreal Protocol, such as sulfur oxides, included in the Revised 1996 IPCC Guidelines may be included at the discretion of the Parties.	Yes	Thailand reported on SO_2 in its BUR.
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.	No	
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:		Thailand provided clarification on ongoing efforts to collect data on international aviation and investigate the availability of data on domestic marine bunker fuels.
	(a) International aviation;	No	
	(b) Marine bunker fuels.	No	
Decision 17/CP.8, annex, paragraph 20	Non-Annex I Parties wishing to report on aggregated GHG emissions and removals expressed in CO_2 eq should use the GWP provided by the IPCC in its 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	Thailand used the Revised 1996 IPCC Guidelines.
	(b) Explanation of the sources of EFs;	No	Thailand used both default values from the Revised 1996 IPCC Guidelines and country-specific factors. Owing to time constraints during preparation of the BUR, the Party clarified the sources of country-specific EFs in the NC3.

Decision	*Provision of the reporting guidelines*	*Yes/partly/ no/NA*	*Comments on the extent of the information provided*
	(c) Explanation of the sources of AD;	Yes	Thailand used AD from relevant agencies, reported in figure 1-23 of the BUR.
	(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	Thailand used the Revised 1996 IPCC Guidelines for all estimates.
	(i) Source and/or sink categories;		
	(ii) Methodologies;		
	(iii) EFs;		
	(iv) AD;		
	(e) Parties are encouraged to identify areas where data may be further improved in future communications through capacity-building.	Yes	Reported in chapter 2.4 of Thailand's BUR.
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	Thailand used notation keys in its BUR, including "NO", "NA" and "NE".
Decision 17/CP.8, annex, paragraph 24	Non-Annex I Parties are encouraged to provide information on the level of uncertainty associated with inventory data and their underlying assumptions, and to describe the methodologies used, if any, for estimating these uncertainties:		
	(a) Level of uncertainty associated with inventory data;	Yes	
	(b) Underlying assumptions;	No	
	(c) Methodologies used, if any, for estimating these uncertainties.	Yes	

Note: The parts of the UNFCCC reporting guidelines on BURs on reporting information on GHG emissions by sources and removals by sinks in BURs are contained in decision 2/CP.17, paragraphs 3–10 and 41(g). Further, as per paragraph 3 of those guidelines, non-Annex I Parties are to submit updates of their national GHG inventories in accordance with paragraphs 8–24 of the "Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention", 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 2
Identification of the extent to which the elements of information on mitigation actions are included in the second biennial update report of Thailand

Decision	*Provision of the reporting guidelines*	*Yes/partly/no*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 11	Non-Annex I Parties should provide information, in a tabular format, on actions to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all GHGs not controlled by the Montreal Protocol.	Yes	
Decision 2/CP.17, annex III, paragraph 12	For each mitigation action or group of mitigation actions, including, as appropriate, those listed in document FCCC/AWGLCA/2011/INF.1, developing country Parties shall provide the following information, to the extent possible:		
	(a) Name and description of the mitigation action, including information on the nature of the action, coverage (i.e. sectors and gases), quantitative goals and progress indicators;	Yes	
	(b) Information on:		
	(i) Methodologies;	Yes	
	(ii) Assumptions;	No	
	(c) Information on:		
	(i) Objectives of the action;	Partly	Objectives were reported for only some of the measures (under the “Targets” column).
	(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;	No	
	(iii) Results achieved, such as estimated outcomes (metrics depending on type of action) and estimated emission reductions, to the extent possible;	Yes	
	(e) Information on international market mechanisms.	No	Thailand informed the TTE that it has clarified this element in its NC3.
Decision 2/CP.17, annex III, paragraph 13	Parties should provide information on the description of domestic measurement, reporting and verification arrangements.	Partly	Thailand reported on institutional arrangements and processes, but did not present information on the methodologies and/or approaches and tools used for data collection, processing and storage.

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, paragraphs 11–13.

Table 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 second biennial update report of Thailand

Decision	*Provision of the reporting requirements*	*Yes/partly/no*	*Comments on the extent of the information provided*
Decision 2/CP.17, annex III, paragraph 14	Non-Annex I Parties should provide updated information on:		
	(a) Constraints and gaps;	Yes	
	(b) Related financial, technical and capacity-building needs.	Yes	
Decision 2/CP.17, annex III, paragraph 15	Non-Annex I Parties should provide:		
	(a) Information on financial resources received, technology transfer and capacity-building received;	Yes	
	(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.	Yes	
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) Technology needs, which are nationally determined;	Yes	
	(b) Technology support received.	Yes	

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

Annex II

Documents and information used during the technical analysis

A. Reference documents

IPCC. 1997. *Revised 1996 IPCC Guidelines for National Greenhouse Gas Inventories*. JL Houghton, LG Meira Filho, B Lim, et al. (eds.). Paris, France: 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.

"Composition, modalities and procedures of the team of technical experts for undertaking the technical analysis of biennial update reports from Parties not included in Annex I to the Convention". Annex to decision 20/CP.19. Available at http://unfccc.int/resource/docs/2013/cop19/eng/10a02.pdf#page=12.

"Modalities and guidelines for international consultation and analysis". Annex IV to decision 2/CP.17. Available at

http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf.

"UNFCCC biennial update reporting guidelines for Parties not included in Annex I to the Convention". Annex III to decision 2/CP.17. Available at http://unfccc.int/resource/docs/2011/cop17/eng/09a01.pdf.

"Guidelines for the preparation of national communications from Parties not included in Annex I to the Convention". Annex to decision 17/CP.8. Available at http://unfccc.int/resource/docs/cop8/07a02.pdf#page=2.

First biennial update report of Thailand. Available at http://unfccc.int/8722.php.

First and second national communication of Thailand. Available at https://unfccc.int/process-and-meetings/transparency-and-reporting/reporting-and-review-under-the-convention/national-communications-and-biennial-update-reports-non-annex-i-parties/national-communication-submissions-from-non-annex-i-parties.

Summary report on the technical analysis of the first biennial update report of Thailand. Available at http://unfccc.int/national_reports/non-annex_i_parties/ica/technical_analysis_of_burs/items/10054.php.

B. Additional information provided by the Party

The following documents[1] were provided by the Party in response to requests for technical clarification during the technical analysis:

Table 4. Sectoral Report for Agriculture (Excel spreadsheet).

Table 6. Sectoral Report for Waste (Excel spreadsheet).

Additional information on the methodologies and data utilized to calculate emissions and country-specific EFs for agriculture, including the detailed uncertainty results for agriculture.

The methodology for each mitigation measure.

[1] Reproduced as received from the Party.