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Report on the technical expert review of the first biennial transparency report of Thailand*

Summary

This report presents the results of the technical expert review of the first biennial transparency report of Thailand, conducted by a technical expert review team in accordance with the modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement. The review took place from 15 to 19 September 2025 in Bangkok.

* In the symbol for this document, 2024 refers to the year in which the biennial transparency report was submitted, not to the year of publication.



Abbreviations and acronyms

2006 IPCC Guidelines	<i>2006 IPCC Guidelines for National Greenhouse Gas Inventories</i>
A6.4ER	emission reduction under Article 6, paragraph 4, of the Paris Agreement
AD	activity data
AR	Assessment Report of the Intergovernmental Panel on Climate Change
BTR	biennial transparency report
CER	certified emission reduction
CH ₄	methane
CO ₂	carbon dioxide
CO ₂ eq	carbon dioxide equivalent
CRT	common reporting table
CTF	common tabular format
EF	emission factor
GHG	greenhouse gas
GWP	global warming potential
HFC	hydrofluorocarbon
HWP	harvested wood products
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
ITMO	internationally transferred mitigation outcome
LULUCF	land use, land-use change and forestry
MPGs	modalities, procedures and guidelines for the transparency framework for action and support referred to in Article 13 of the Paris Agreement
N ₂ O	nitrous oxide
NA	not applicable
NAP	national adaptation plan
NC	national communication
NDC	nationally determined contribution
NE	not estimated
NF ₃	nitrogen trifluoride
NIR	national inventory report
PaMs	policies and measures
PFC	perfluorocarbon
QA/QC	quality assurance/quality control
REDD+	reducing emissions from deforestation; reducing emissions from forest degradation; conservation of forest carbon stocks; sustainable management of forests; and enhancement of forest carbon stocks (decision 1/CP.16, para. 70)
SF ₆	sulfur hexafluoride
TERT	technical expert review team
WAM	‘with additional measures’
WM	‘with measures’
WOM	‘without measures’

I. Introduction and summary

A. Introduction

1. This report covers the technical expert review of the BTR1 of Thailand. The review was organized by the secretariat and conducted by the TERT in accordance with the MPGs,¹ particularly chapter VII thereof. Thailand, on a voluntary basis, requested the secretariat to organize a review of the information reported pursuant to chapter IV of the MPGs as part of the technical expert review.² The outcome of the voluntary review is presented in annex I.

2. A draft version of this report was transmitted to the Government of Thailand, which responded that it did not have any comments.³

3. The review was conducted as an in-country review from 15 to 19 September 2025 in Bangkok by the following team of nominated experts from the UNFCCC roster of experts: Jorge Alvarez (Peru), Signe Kynding Borgen (Denmark), Rana Humatova (Azerbaijan), Mark Hunstone (Australia), Mwangi James Kinyanjui (Kenya), Traute Koether (Austria), Sergii Shmarin (Ukraine) and Tshering Yangzom (Bhutan). Mark Hunstone and Mwangi James Kinyanjui were the lead reviewers. The review was coordinated by Andrea Nuesse (secretariat).

B. Scope

4. The TERT conducted a technical expert review of the information reported in the BTR1 of Thailand as per the scope of the review defined in paragraph 146 of the MPGs and decision 9/CMA.4, consisting of:

(a) Review of the consistency of the information submitted by the Party under Article 13, paragraphs 7 and 9, of the Paris Agreement with the MPGs taking into account the flexibility accorded to the Party under Article 13, paragraph 2, of the Paris Agreement (see chap. II.A below);

(b) Consideration of the Party's implementation and achievement of its NDC under Article 4 of the Paris Agreement (see chap. II.B below);

(c) Identification of areas of improvement⁴ for the Party related to implementation of Article 13 of the Paris Agreement (see chap. II.D below);

(d) Assistance in identifying capacity-building needs (see chap. II.E below);

(e) Voluntary review of the information reported by the Party pursuant to chapter IV of the MPGs (see annex I).

C. Summary

5. Thailand submitted its BTR1 on 26 December 2024, before the deadline of 31 December 2024 mandated in decision 18/CMA.1. Thailand submitted its CRTs on 12 June 2025, after the deadline of 31 December 2024, and CTF tables on 12 June 2025, after the deadline of 31 December 2024. The TERT noted the delay in the submissions.

6. The TERT took note of the report on the technical expert review under Article 6, paragraph 2, of the Paris Agreement of the initial report referred to in chapter IV.A (Initial report) of the annex to decision 2/CMA.3 of Thailand⁵ and notes that this information is not subject to consideration as part of the technical expert review of the BTR.

¹ Decision 18/CMA.1, annex.

² See decision 9/CMA.4, para. 1.

³ As per para. 162(e) of the MPGs.

⁴ As referred to in paras. 7, 8, 146(d) and 162(d) of the MPGs.

⁵ Contained in document FCCC/A6/IRTERR.1/2024/THA, available at <https://unfccc.int/documents/646801>.

7. A list of the areas of improvement identified on the basis of the review of the consistency of the reported information with the MPGs can be found in the assessment tables.⁶

8. The Party applied flexibility as provided for those developing country Parties that need it in the light of their capacities pursuant to Article 13, paragraph 2, of the Paris Agreement in relation to the NIR of anthropogenic GHG emissions by sources and removals by sinks.⁷ Information on where the flexibility was applied is included in chapters II.A.1–II.A.2 below.

D. Information provided by the Party pursuant to paragraphs 143–145 of the modalities, procedures and guidelines

9. Thailand reported information on support needed and received for implementing Article 13 of the Paris Agreement and transparency-related activities, including for transparency-related capacity-building. The Party reported on support needed and received for preparing reports pursuant to Article 13 of the Paris Agreement and addressing the areas of improvement identified by the TERT. Support is needed primarily for using the 2006 IPCC Guidelines for preparing the NIR, whereas support has been received for building a national data system for preparing the BTR1 and combined NC5 and BTR2. The TERT noted that the above-mentioned information reported by the Party is not subject to review as per the scope of the review defined in paragraph 146 of the MPGs.

II. Technical expert review⁸

A. Review of the consistency of the submitted information with the modalities, procedures and guidelines⁹

1. National inventory report¹⁰

10. The TERT assessed the information reported in the BTR1 of Thailand and identified areas of improvement relating to consistency with the MPGs, which are described in tables 2–7 of the assessment tables referred to in paragraph 7 above and summarized in table 1.

⁶ Contained in document FCCC/ETF/TERR.1/2024/THA/Add.1, available at <https://unfccc.int/first-biennial-transparency-reports>.

⁷ The developing country Party applied flexibility in the light of its capacities with respect to the provision in para. 57 of the MPGs.

⁸ As per para. 187 of the MPGs.

⁹ As per para. 146(a) of the MPGs.

¹⁰ As per para. 150(a) of the MPGs.

Table 1

Information reported in Thailand's national inventory report and review of consistency with the modalities, procedures and guidelines

<i>Element</i>	<i>Elements of information to be reported</i>	<i>Response and its summary, as relevant</i>	<i>ID#(s) for the area(s) of improvement identified^a</i>
Submission type (para. 12 of the MPGs)	Has the NIR been submitted as a stand-alone document?	No	No areas of improvement were identified
Time series (paras. 57–58 of the MPGs)	What years have been reported and is the time series in accordance with the MPGs? ^b	2000–2022, in accordance with the MPGs	No areas of improvement were identified
Metrics (para. 37 of the MPGs)	Has the Party used the 100-year GWP values from the AR5?	Yes	No areas of improvement were identified
	Has the Party used other metrics?	No	No areas of improvement were identified
Gases (paras. 47–49 and 51 of the MPGs)	Which gases have been reported?	CO ₂ , CH ₄ , N ₂ O, HFCs and SF ₆	2.G.11, 4.I.1
Indirect emissions (para. 52 of the MPGs)	Has the Party reported indirect CO ₂ emissions and national totals with and without indirect CO ₂ ?	No	No areas of improvement were identified
	Has the Party reported indirect N ₂ O emissions from sources other than those in the agriculture and LULUCF sectors as a memo item?	No	No areas of improvement were identified
National circumstances and institutional arrangements (paras. 18–19 of the MPGs)	Has the Party reported information on the functions related to inventory planning, preparation and management?	Partly	2.G.1
Methodologies, parameters and data (paras. 20–24 of the MPGs)	Has the Party used the 2006 IPCC Guidelines?	Yes	2.G.2, 4.I.4, 6.L.1, 6.L.5, 6.L.7, 7.W.3, 7.W.5
	Has the Party used other IPCC methodological guidance?	Yes, the <i>2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories</i> and the <i>IPCC Good Practice Guidance and Uncertainty Management in National Greenhouse Gas Inventories</i>	4.I.6
Key category analysis (paras. 25 and 41–42 of the MPGs)	Has the Party reported a key category analysis?	Yes, a key category analysis was performed using approach 1 and a 95 per cent threshold for level and trend assessment for the latest reporting year (2022) and with LULUCF	2.G.3

<i>Element</i>	<i>Elements of information to be reported</i>	<i>Response and its summary, as relevant</i>	<i>ID#(s) for the area(s) of improvement identified^a</i>
Time-series consistency and recalculations (paras. 26–28 and 43 of the MPGs)	Has the Party reported a consistent time series?	Partly	4.I.2
	Has the Party provided justification and explanatory information for recalculations?	Yes	No areas of improvement were identified
Uncertainty assessment (paras. 29 and 44 of the MPGs)	Has the Party reported the results of the uncertainty analysis and the methods used, underlying assumptions and trends?	Yes, including level uncertainty, reported using approach 1 for the starting year (2000) and the latest reporting year (2022)	2.G.4, 4.I.11, 6.L.2
QA/QC plan and procedures (paras. 34–36 and 46 of the MPGs)	Has the Party elaborated information on an inventory QA/QC plan, including information on the inventory agency responsible for implementing QA/QC, and current and future QA/QC procedures?	Partly	2.G.6, 2.G.7, 4.I.9, 7.W.1, 7.W.15
Assessment of completeness (paras. 30–33, 45, 47 and 50 of the MPGs)	Have any areas of improvement for lack of completeness been identified for the following sectors?		2.G.5, 2.G.11, 5.A.2, 7.W.6
	Energy	Yes	3.E.2, 3.E.3, 3.E.5, 3.E.9, 3.E.10
	IPPU	Yes	4.I.1, 4.I.10
	Agriculture	Yes	5.A.2
	LULUCF	Yes	6.L.1, 6.L.4, 6.L.5, 6.L.6, 6.L.8, 6.L.9, 6.L.10, 6.L.11, 6.L.12
	Waste	Yes	7.W.13
Threshold for reporting significant categories (para. 32 of the MPGs)	For categories reported as “NE” owing to insignificance, has information been reported showing that the likely level of emissions is below the threshold of significance?	No	6.L.8, 7.W.13
Methodologies, EFs, parameters and AD (paras. 39–40 and 53–56 of the MPGs)	Has information been transparently reported on categories, gases, methodologies (including the rationale for selecting them), EFs and AD at a disaggregated level for the following sectors?	Partly	2.G.10, 5.A.1

<i>Element</i>	<i>Elements of information to be reported</i>	<i>Response and its summary, as relevant</i>	<i>ID#(s) for the area(s) of improvement identified^a</i>
	Energy	Partly	3.E.2, 3.E.3, 3.E.4, 3.E.5, 3.E.9, 3.E.10, 3.E.11
	Has information been reported on international aviation and marine bunker fuel emissions as two separate entries and such emissions distinctly reported from national totals?	Yes	No areas of improvement were identified
	Has information been reported indicating how feedstocks and non-energy use of fuels have been accounted for in the inventory, under the energy or IPPU sector?	Partly	No areas of improvement were identified
	IPPU	Partly	4.I.7
	Agriculture	Yes	No areas of improvement were identified
	LULUCF	Partly	6.L.7, 6.L.13
	Waste	Partly	7.W.2, 7.W.4, 7.W.7, 7.W.8, 7.W.10, 7.W.11, 7.W.12, 7.W.14, 7.W.17

^a See document FCCC/ETF/TERR.1/2024/THA/Add.1. The areas of improvement referred to in this table comprise only those relating to recommendations in that document.

^b The developing country Party applied flexibility in the light of its capacities with respect to this provision.

2. Information necessary to track progress in implementing and achieving the nationally determined contribution¹¹

11. The TERT assessed the information reported in the BTR1 of Thailand and identified areas of improvement relating to consistency with the MPGs, which are described in tables 8 and 10–13 of the assessment tables referred to in paragraph 7 above and summarized in table 2.

Table 2

Information reported in Thailand's submission

<i>Topic</i>	<i>ID#(s) for the area(s) of improvement identified^a</i>
National circumstances and institutional arrangements (paras. 59–63 of the MPGs)	8.1, 8.2, 8.3
Description of the NDC under Article 4 of the Paris Agreement, including updates (para. 64 of the MPGs)	No areas of improvement were identified
Information necessary to track progress in implementing and achieving the NDC under Article 4 of the Paris Agreement (paras. 65–79 of the MPGs)	10.1, 10.2, 10.3
Mitigation PaMs, actions and plans related to implementing and achieving the NDC under Article 4 of the Paris Agreement (paras. 80–90 of the MPGs)	11.1, 11.2, 11.3, 11.5
Summary of GHG emissions and removals (para. 91 of the MPGs)	12.1
Projections of GHG emissions and removals (paras. 92–102 of the MPGs)	13.1, 13.3

^a See document FCCC/ETF/TERR.1/2024/THA/Add.1. The areas of improvement referred to in this table comprise only those relating to recommendations in that document.

3. Financial, technology development and transfer, and capacity-building support provided¹²

12. According to paragraph 118 of the MPGs, developed country Parties shall provide information pursuant to Article 13, paragraph 9, of the Paris Agreement in accordance with the MPGs contained in chapter V of the annex to decision 18/CMA.1. Other Parties that provide support should also provide such information and, in doing so, are encouraged to use the same MPGs contained in that chapter.

13. Pursuant to Article 13, paragraph 9, of the Paris Agreement, developed country Parties shall and other Parties that provide support should provide information on financial, technology development and transfer, and capacity-building support provided to developing country Parties under Articles 9–11 of the Paris Agreement.

14. Thailand did not consider itself subject to the reporting obligations applicable to developed country Parties pursuant to Article 13, paragraph 9, of the Paris Agreement. Accordingly, the Party did not provide information on financial, technology development and transfer, or capacity-building support provided to developing country Parties under Articles 9–11 of the Paris Agreement in its BTR1.

¹¹ As per para. 150(b) of the MPGs.

¹² As per para. 150(c) of the MPGs.

B. Consideration of the Party's implementation and achievement of its nationally determined contribution¹³

15. In considering Thailand's progress in implementing and achieving its NDC, the TERT noted that the NDC¹⁴ is a commitment to reducing total GHG emissions by 30 per cent (166,500 kt CO₂ eq) compared with the projected 'business as usual' level of 555,000 kt CO₂ eq in 2030. Thailand's single-year economy-wide absolute emission reduction target covers all CRT sectors, excluding LULUCF, and the gases CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, but not NF₃. The Party also has a conditional target of reducing total GHG emissions, excluding LULUCF, by 40 per cent (222,000 kt CO₂ eq) compared with the projected 'business as usual' level of 555,000 kt CO₂ eq in 2030. The conditional target is based on the assumption that the Party will receive adequate and enhanced access to financial, technology development and transfer, and capacity-building support. Furthermore, Thailand aims to achieve carbon neutrality by 2050 and net zero GHG emissions by 2065.

16. The indicators that Thailand selected to track progress in implementing and achieving its NDC are described in table 3.

Table 3

Description of the indicator(s) selected by Thailand to track progress in implementing and achieving its nationally determined contribution

<i>NDC target</i>	<i>Indicator</i>	<i>Description</i>
Economy-wide (excluding LULUCF) GHG emission reduction of 30 per cent compared with a 'business as usual' level of 555,000 kt CO ₂ eq by 2030	GHG emission reduction in the relevant reporting year (kt CO ₂ eq)	Total economy-wide (excluding LULUCF) GHG emission reduction in the relevant reporting year (kt CO ₂ eq) compared with the 'business as usual' level in 2030
	GHG emission reduction in the relevant reporting year (per cent)	Total economy-wide (excluding LULUCF) GHG emission reduction in the relevant reporting year (per cent) compared with the 'business as usual' level in 2030

Sources: Thailand's BTR1 and CTF tables 1–3.

17. The TERT noted that the contribution of LULUCF to achieving the NDC is not included in the Party's baseline scenario or target-year level and that Thailand did not use ITMOs, A6.4ERs or CERs from cooperative approaches referred to in Article 6, paragraph 2, of the Paris Agreement or the mechanism established by Article 6, paragraph 4, of the Paris Agreement towards the achievement of its NDC.

18. Table 4 summarizes information on progress in implementing the NDC based on the indicator GHG emission reduction in the relevant reporting year (kt CO₂ eq) taking into account the type of Thailand's NDC target, including quantitative values for the end year of the baseline scenario, implementation period, including the most recent year available, and target year.

Table 4

Summary of information on Thailand's progress in implementing and achieving its nationally determined contribution

(kt CO₂ eq)

	<i>Annual reduction in GHG emissions excluding LULUCF compared with target level (2030)</i>	<i>Contribution of LULUCF, as applicable</i>	<i>ITMOs, A6.4ERs and/or CERs used towards NDC, as applicable^a</i>	<i>Indicator adjusted for contribution of LULUCF and ITMOs, A6.4ERs and/or CERs used towards NDC, as applicable</i>
2021	189 213.80	NA	NA	189 213.80
2022	169 058.86	NA	NA	169 058.86

¹³ As per para. 146(b) of the MPGs.

¹⁴ The consideration of the Party's implementation and achievement of its NDC is in the context of the NDC submitted by Thailand on 2 November 2022.

<i>Annual reduction in GHG emissions excluding LULUCF compared with target level (2030)</i>	<i>Contribution of LULUCF, as applicable</i>	<i>ITMOs, A6.4ERs and/or CERs used towards NDC, as applicable^a</i>	<i>Indicator adjusted for contribution of LULUCF and ITMOs, A6.4ERs and/or CERs used towards NDC, as applicable</i>
Target level (2030) ^b			166 500.00 ^c

Sources: Thailand’s BTR1 and CTF table 4, and information provided by the Party during the review.

^a The TERT acknowledged that an expert review of regular information under Article 6 has not taken place. Therefore, ITMOs reported as first transferred were not taken into account when considering progress towards the NDC.

^b Target level corresponds to an unconditional NDC target.

^c A different GWP has been used for the ‘business as usual’ projections (AR4) and the inventory (AR5).

19. The TERT noted that the baseline GHG emissions (‘business as usual’ projections) and the target level for 2030 were calculated on the basis of GWP values from the AR4, while the net GHG emissions in 2022 were calculated on the basis of GWP values from the AR5. As such, a comparison of the target levels and net GHG emissions may not be appropriate owing to the different methods used to estimate these levels and emissions. The TERT noted that no adjustment has been applied for specific LULUCF accounting or ITMO transfer.

20. Thailand reported information on the actions and PaMs that support the implementation and achievement of its NDC. Table 5 provides a summary of the reported information on the key PaMs of Thailand.

Table 5
Summary of information on key policies and measures reported by Thailand

<i>Sector</i>	<i>Key PaMs^{a, b}</i>	<i>Estimate of achieved GHG emission reductions in 2022 (kt CO₂ eq)</i>	<i>Estimate of expected GHG emission reductions in 2030 (kt CO₂ eq)</i>
Energy			
Energy efficiency	Energy-saving label: energy-saving labelling on energy-consuming devices for energy efficiency	1 361.50	9 630.00
	Energy Conservation Fund: financial support for the implementation of energy-saving measures in designated factories and buildings	–	9 050.00
Energy supply and renewables	Biomass electricity replacing grid electricity and biomass thermal replacing fossil fuels	28 043.80	64 940.00
	Solar power replacing grid electricity and solar thermal replacing fossil fuel	2 664.10	4 930.00
Transport	Biofuels blended with diesel used in internal combustion engines	3 726.90	4 790.00
	Ethanol blended with gasoline used in internal combustion engines	2 059.70	3 740.00
IPPU	Use of substitute materials to replace cement in ready-mixed concrete	466.90	100.00
	Modifying refrigeration systems under the Refrigeration and Air Conditioning Nationally Appropriate Mitigation Actions project	–	300.00
Agriculture	Waste management in the livestock sector	3 245.90	3 000.00
	Measures for alternate wet and dry rice cultivation	–	1 000.00

<i>Sector</i>	<i>Key PaMs^{a, b}</i>	<i>Estimate of achieved GHG emission reductions in 2022 (kt CO₂ eq)</i>	<i>Estimate of expected GHG emission reductions in 2030 (kt CO₂ eq)</i>
Waste	Increasing the production of biogas from industrial wastewater and reusing the resulting CH ₄	3 893.00	4 000.00
	Burning landfill gas or using it for electricity generation	955.90	1 860.00

Sources: Thailand's BTR1 and CTF table 5.

^a Names of PaMs reproduced as reported in Thailand's BTR.

^b All PaMs listed were included in the WM scenario projections.

21. Thailand reported 33 PaMs considered key to achieving its NDC and for which it reported expected GHG emission reductions in 2030. The TERT noted that PaMs, actions and plans have contributed to GHG emission reductions in the energy, transport, IPPU, agriculture and waste sectors. GHG emissions significantly increased by 53.5 per cent across all sectors in 2000–2022, which indicates that economic drivers such as increased demand for energy and urbanization and growth in passenger and cargo transport, as well as increased food production and waste generation driven by population growth, have limited the effects of mitigation PaMs in this period.

22. The TERT noted that the energy sector remained the largest source of GHG emissions in Thailand, accounting for 65.9 per cent of the national total (excluding LULUCF) in 2022, and is therefore the most important sector for mitigation efforts, which include a shift to renewables and improved energy efficiency. However, GHG emissions in the energy sector significantly increased by 53.2 per cent in 2000–2022, driven by greater energy consumption due to economic development, population growth and urbanization, as well as by rapid motorization and growth in passenger and cargo transport.

23. In the IPPU sector, GHG emissions significantly increased by 90.5 per cent in 2000–2022, mainly driven by an increase in emissions from product uses as substitutes for ozone-depleting substances resulting from an increased demand for refrigeration and air conditioning, as well as an increased demand for products from the mineral industry (e.g. cement, lime and glass) and the chemical industry (e.g. basic chemical products and downstream chemicals such as fertilizers, paints, cosmetics, surfactants and plastics).

24. In the agriculture sector, which mainly comprises crop cultivation (especially rice) and livestock farming, GHG emissions increased by 31.1 per cent in 2000–2022, and the sector accounted for 17.9 per cent of the country's total emissions in 2022, which indicates that economic drivers such as increased demand for food (both domestically and for export) and population growth have counteracted the effects of mitigation PaMs in this period.

25. In the waste sector, GHG emissions nearly doubled in 2000–2020 and accounted for 5.8 per cent of the country's total emissions in 2022, which indicates that economic drivers such as increased demand for plastics (e.g. in food retail) and population growth have counteracted the effects of mitigation PaMs in this period.

26. The TERT noted that the Party's population growth, urbanization, rapid motorization and increases in passenger and cargo transport, and economic development, as well as its geographic profile, are the key national circumstances affecting GHG emissions and removals over time that are relevant to progress in implementing and achieving Thailand's NDC. The trends for 2000–2022 show that Thailand's population increased by 9.7 per cent during this period,¹⁵ while its gross domestic product increased by 103.4 per cent.¹⁶ The country's urban population increased from 31.1 to 59.7 per cent¹⁷ of the total population between 2000 and 2022 and the number of registered road motor vehicles per 1,000 people

¹⁵ UNdata. (n.d.). UNdata Explorer. Available at <http://data.un.org/Explorer.aspx>.

¹⁶ Office of the National Economic and Social Development Council. (n.d.). Table 2: Expenditure on gross domestic product, chain volume measures [reference year = 2002]. Quarterly Gross Domestic Product (QGDP). Available at <https://www.nesdc.go.th>.

¹⁷ See footnote 15 above.

increased by 55.4 per cent between 2008 and 2022. Between 2000 and 2022, Thailand's total primary energy supply increased by 73.0 per cent and the share of fossil fuels in the primary energy supply increased from 80.8 to 81.6 per cent in the same period.¹⁸ Following a sharp decrease (–6.1 per cent) in economic activity from 2020 to 2021 owing to the 2019 coronavirus disease pandemic, Thailand's gross domestic product increased by 1.6, 2.6 and 2.0 per cent in 2021, 2022 and 2023 respectively.¹⁹

27. Thailand reported projections for 2022–2030 under the WM scenario. The WM scenario reported by the Party includes PaMs implemented and adopted. In addition to the WM scenario, Thailand reported the WAM and WOM scenarios. The projected emission levels are presented in table 6.

Table 6

Summary of greenhouse gas emission projections for Thailand

	<i>GHG emissions (kt CO₂ eq/year)</i>	<i>Change in relation to 2020 level (%)</i>	<i>Change in relation to 2022 level (%)</i>
Inventory data 2020	376 301.68		
Inventory data 2022	385 941.14	2.6	
WOM projections for 2030	555 000.00	47.5	43.8
WM projections for 2030	388 500.00	3.2	0.7
WAM projections for 2030	333 000.00	–11.5	–13.7

Sources: Thailand's BTR1 and CTF table 7.

Note: The projections are for GHG emissions without LULUCF.

28. The TERT noted that, in the WOM scenario that corresponds to the baseline scenario, GHG emissions are expected to increase by 43.8 per cent in 2022–2030. In the WM scenario, GHG emissions are projected to increase by 0.7 per cent in 2022–2030, while in the WAM scenario, GHG emissions are projected to decrease by 13.7 per cent in 2022–2030.

29. The TERT assessed Thailand's progress towards its target for 2021–2030. Thailand's achieved emission reductions in 2022 compared with the 2030 level (65,235 kt CO₂ eq) exceeded the projected 'business as usual' emission reductions for 2022 (60,430 kt CO₂ eq) and the emission level in 2022 (385,941 kt CO₂ eq) was just below the 2030 target emission level (388,500 kt CO₂ eq). The TERT notes that there are not yet enough data to sufficiently assess the Party's progress in implementing the NDC, as it is still early in the implementation period (2021–2030). The impact of the change in GWP values as mentioned in paragraph 19 above was not considered. Additionally, any future update of the GHG inventory, especially for categories 1.B fugitive emissions and 2.F product uses as substitutes for ozone-depleting substances and subcategory 5.C.2 open burning of waste, may lead to a higher emission level.

C. Consideration of the Party's support provided²⁰

30. Thailand did not consider itself subject to the reporting obligations applicable to developed country Parties pursuant to Article 13, paragraph 9, of the Paris Agreement and did not report information in its BTR1 on support provided (see para. 14 above).

D. Identification of areas of improvement²¹

31. During the technical expert review, the TERT identified areas of improvement in relation to Thailand's implementation of Article 13 of the Paris Agreement, which are

¹⁸ UNdata. (n.d.). UN Statistics Energy Balance. DF_UNData_EnergyBalance – Energy Balance DataFlow. Available at <https://data.un.org/SdmxBrowser/start>.

¹⁹ World Bank. (n.d.). GDP growth (annual %). Available at <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG>.

²⁰ As per para. 146(c) of the MPGs.

²¹ As per para. 146(d) of the MPGs.

summarized in chapter II.A above and included in the assessment tables referred to in paragraph 7 above.

E. Assistance in identifying capacity-building needs²²

32. The TERT, in consultation with Thailand, identified the following prioritized needs for capacity-building to facilitate the Party's reporting in its BTR relating to the flexibilities applied by it as per the MPGs:²³

(a) Strengthening technical and institutional capacity to understand the MPGs related to the application of flexibility provisions;

(b) Enhancing technical capacity related to reporting accurate, complete and consistent GHG inventories using the CRTs for the entire time series.

33. Furthermore, in order to facilitate continuous improvement in reporting, the following additional capacity-building needs were identified during the review:

(a) Strengthening institutional and technical capacity to elaborate, implement and report on overarching QA/QC activities and category-specific inventory QA/QC plans for the entire preparation process to ensure consistency between the BTR, national inventory document (as a chapter of the BTR or a stand-alone document), CRTs and CTF tables;

(b) Improving completeness of reporting in the CRTs, including the use of notation keys where numerical data are not available and the provision of supporting information in CRT 9;

(c) Improving the transparency of the GHG inventory by including descriptions of the methods used, the rationale for the choice of methods, and descriptions, assumptions, references and sources of information used for the EFs and AD applied, and reporting on progress towards NDC targets;

(d) Establishing institutional arrangements to support the systematic collection of AD and the development of EFs and other parameters at a disaggregated level, in line with tier 1 requirements for key categories under the 2006 IPCC Guidelines, while enabling the application of higher-tier methodologies where feasible;

(e) Improving institutional arrangements to allow for the collection of data on feedstocks and the non-energy-related use of fuels, to establish QA/QC procedures for ensuring that relevant information is included in the energy or IPPU sector in accordance with the 2006 IPCC Guidelines;

(f) Developing a spatially explicit (approach 3) land representation for estimating areas of land use and land-use change to enable areas in remaining and conversion categories to be reported for the appropriate time series by establishing a monitoring system that uses remote sensing to continuously update data on land-use changes and to construct a historical land-use change matrix;

(g) Collecting and combining data to develop a geospatial national soil map for estimating areas with mineral and organic soils and for identifying natural peatlands and drained areas for forestry or agricultural production with the aim of reporting all land uses and land-use changes;

(h) Developing a higher-tier method for estimating changes in soil organic carbon stocks in mineral soils on cropland using a model-based approach by collecting AD from historical and present agricultural management practices and by collecting data on pedoclimatic conditions to model and define appropriate stratification for the inventory;

(i) Establishing a system for collecting data on and estimating emissions from HWP by collecting historical and current data on the production, import and export of semi-finished HWP, including sawnwood, wood-based panels and paper and paperboard, to

²² As per para. 146(e) of the MPGs.

²³ For a complete list of the capacity-building needs identified by the TERT in consultation with the Party, see table 15 in document FCCC/ETF/TERR.1/2024/THA/Add.1.

support the estimation of emissions and removals associated with carbon stock changes in HWP using the tier 1 method from the 2006 IPCC Guidelines;

(j) Improving the estimates of fluorinated gases, including by gaining a better understanding of the applications where imported gases are being consumed and using disaggregated EFs by life cycle stage;

(k) Providing estimations of GHG emissions from subcategories 3.D.1.b.ii sewage sludge applied to soils, 3.D.1.e mineralization/immobilization associated with loss/gain of soil organic matter and 3.D.1.f cultivation of organic soils (i.e. histosols) and category 3.E prescribed burning of savannahs;

(l) Strengthening institutional and technical capacity to understand the provisions of the MPGs, especially those related to tracking progress towards the NDC;

(m) Strengthening institutional and technical capacity to understand and develop knowledge on the functionality of the enhanced transparency framework progress reporting tool;

(n) Identifying and assessing national circumstances (main drivers) that affect GHG emissions and removals over time;

(o) Identifying and assessing mitigation PaMs, actions and plans, as well as their relation to and impact on the key categories referred to in the national GHG inventory;

(p) Strengthening institutional and technical capacity to identify and assess interactions between mitigation PaMs, actions and plans, including those in the LULUCF sector;

(q) Strengthening institutional and technical capacity to identify and assess costs and non-GHG mitigation benefits of PaMs, specifically by collecting data and using a relevant methodology for calculating and reporting on the costs of mitigation PaMs, actions and plans and by building expertise and capacity in relation to identifying non-GHG mitigation benefits;

(r) Preparing and reporting projections in line with the MPGs and specifically reporting projections for a minimum of 15 years beyond the next year ending in zero or five after the latest inventory (in this case, up to 2040);

(s) Using models to develop projections and carry out a sensitivity analysis of the modelled projections;

(t) Disaggregating projections by gas.

34. Thailand also identified the capacity-building support needs in its BTR1 (table 5-1).

III. Conclusions and recommendations

35. The TERT conducted a technical expert review of the information reported in the BTR1, CRTs and CTF tables of Thailand in accordance with the MPGs.

36. The areas of improvement identified by the TERT on the basis of the review of the consistency of the information reported by Thailand with the MPGs are summarized in chapter II.A above and included in the assessment tables referred to in paragraph 7 above.

37. The TERT notes that there are not yet enough data to sufficiently assess the Party's progress in implementing the NDC, as it is still early in the implementation period (2021–2030). The impact of the change in GWP values was not considered and any update of the GHG inventory may lead to a higher emission level.

38. The TERT also notes that PaMs, actions and plans have contributed to limiting GHG emission increases in the energy, transport, IPPU, agriculture and waste sectors, although increased demand for electricity, products (e.g. refrigerants, cement, plastics, fertilizers, paints and surfactants) and food (both domestically and for export) and increased urbanization and road transport, as well as population growth, resulted in an increase in GHG emissions across all sectors.

39. Thailand did not consider itself subject to reporting obligations applicable to developed country Parties pursuant to Article 13, paragraph 9, of the Paris Agreement and, in accordance with the MPGs, did not report information on financial, technology development and transfer, or capacity-building support provided under Articles 9–11 of the Paris Agreement in its BTR1.²⁴

40. Regarding the implementation of Article 13 of the Paris Agreement and transparency-related activities, Thailand reported information on support needed and received. Support is needed primarily for using the 2006 IPCC Guidelines for preparing the NIR, whereas support has been received for building a national data system for preparing the BTR1 and combined NC5 and BTR2.

41. In consultation with Thailand, the TERT identified reporting-related needs for capacity-building support relating to the flexibilities applied by the Party as per the MPGs that could facilitate the Party's preparation of subsequent BTRs. For Thailand, the main reporting-related needs for capacity-building support are the need to gain a general understanding of the MPGs related to the application of flexibility provisions²⁵ and the need to enhance technical capacity related to reporting accurate, complete and consistent GHG inventories using CRTs for the entire time series.²⁶

²⁴ As per para. 118 of the MPGs.

²⁵ As per para. 6 of the MPGs.

²⁶ As per para. 57 of the MPGs.

Annex I

Outcome of the review conducted on a voluntary basis of the information reported by the Party in its first biennial transparency report pursuant to chapter IV of the modalities, procedures and guidelines

I. Summary of reported information

1. In its BTR1 Thailand provided information related to climate change impacts and adaptation under Article 7 of the Paris Agreement pursuant to chapter IV of the MPGs and, as per paragraph 1 of decision 9/CMA.4, on a voluntary basis, requested the secretariat to organize a review of that information as part of the technical expert review pursuant to chapter VII of the MPGs.

2. In accordance with chapter IV of the MPGs, Thailand provided information on its climate change impacts; risks and vulnerabilities; adaptation priorities and barriers to implementing adaptation action; and cooperation, good practices, experience and lessons learned in relation to climate change impacts and adaptation, which is summarized in table I.1.

Table I.1

Summary of information on vulnerability and adaptation to climate change reported by the Party

<i>Priority adaptation sector or area</i>	<i>Vulnerability and adaptation measures reported</i>	<i>Challenges and constraints</i>	<i>Cooperation, good practices, experience and lessons learned</i>
Coastal zones	Vulnerability: the 3,151 km coastline is vulnerable to erosion (823.06 km affected in 2021), sea level rise, coral bleaching and acidification, impacting marine ecosystems and communities. Adaptation measure: mangrove rehabilitation (1,737,020 <i>rai</i> ^a in good condition in 2020) and coral conservation on Koh Mak are addressing the risks; the National Disaster Prevention and Mitigation Plan supports coastal resource management.	Limited capacity for management of and early warning systems for sea level rise poses barriers.	Collaboration with the United Nations Development Programme and local groups such as Designated Areas for Sustainable Tourism Administration for marine protected areas, Koh Mak’s community-based tourism and waste management demonstrate sustainable practices, and lessons learned through engaging the Koh Mak Subdistrict Administrative Organization for integrated resilience.
Drought	Vulnerability: drought poses serious challenges to water resources, agriculture and livelihoods in Thailand, with the north-eastern region being especially vulnerable owing to its reliance on water-intensive rice cultivation, which suffers reduced yields during dry spells. Adaptation measure: Thailand has implemented drought-resistant crop varieties and enhanced water storage infrastructure alongside ongoing efforts such as community-based water management under the 20-Year Water Resources Management Master Plan and early warning systems to support efficient resource allocation.	Challenges in farmer adaptation and effective risk mapping are limiting responses.	Cooperation with the Department of Agricultural Extension and community networks for water management; good practices include knowledge-sharing via apps and lessons learned include the need for better weather forecasting.
Ecosystems and biodiversity ^b	Vulnerability: Thailand’s ecosystems and biodiversity are increasingly	Insufficient funding for conservation, limited	Partnerships with the International Union for

<i>Priority adaptation sector or area</i>	<i>Vulnerability and adaptation measures reported</i>	<i>Challenges and constraints</i>	<i>Cooperation, good practices, experience and lessons learned</i>
	<p>vulnerable to climate change, as rising temperatures, changing rainfall patterns and extreme weather events threaten critical habitats, disrupt species distribution and intensify pressures on already fragile terrestrial and marine ecosystems.</p> <p>Adaptation measure: the National Biodiversity Action Plan 2023–2027 focuses on conservation and restoration. The Doi Chiang Dao biosphere reserve implements ecosystem-based approaches such as reforestation and endemic species support.</p>	<p>research on impacts and challenges integrating adaptation into land-use plans are constraining efforts.</p>	<p>Conservation of Nature, the United Nations Development Programme (Global Biodiversity Framework Early Action Support project) and the Association of Southeast Asian Nations via the Biodiversity Finance Initiative Phase II and the Biodiversity and Ecosystem Services Network are enhancing capacity for nature-based solutions, while the Doi Chiang Dao community-led agroforestry project under the Bio-Circular-Green Economy Model exemplifies sustainable natural resource management by supporting local livelihoods and ecological balance.</p>
Fisheries	<p>Vulnerability: seagrass beds, coral reefs and mangroves, which serve as critical nursery grounds for fish, are being increasingly threatened by sea level rise, an increase in seawater temperature, seawater acidification, bleaching and coastal erosion, which are contributing to a decline in marine animal populations and are directly reducing fisheries productivity.</p> <p>Adaptation measure: promoting climate-resilient aquaculture practices, such as diversifying cultured species and building capacity for local fishers and aquaculture operators to apply adaptive techniques.</p>	<p>Scientific data and systematic monitoring on how climate change affects fish stocks, ecosystems and fisheries-dependent livelihoods are limited.</p>	<p>Marine conservation is integrated into provincial planning in Trang through the Dugong and Seagrass Conservation Plan and protected area designation. Innovative monitoring (e.g. drones and participatory science) supports ecosystem mapping and species tracking, while community-based ecotourism is establishing a link between livelihoods and conservation with profit reinvestment.</p>
Food and agriculture ^b	<p>Vulnerability: the agriculture sector is highly vulnerable to extreme weather events, including droughts, rising temperatures and more intense rainfall, posing significant risks to crop yields and overall production.</p> <p>Adaptation measure: Thailand has strengthened agricultural adaptation by promoting climate-smart practices and precision farming, enhancing early warning systems, and introducing resilient crop and livestock varieties to improve tolerance to drought, heat and pests.</p>	<p>Key challenges include farmers’ limited knowledge of climate change adaptation, limited access to climate-resilient technologies, and inadequate financial resources to support research and adaptation actions.</p>	<p>Thailand’s Agriculture Strategic Plan on Climate Change (2023–2027) integrates adaptation and mitigation through climate-smart agriculture, digital tools and sustainable practices, aligning the sector with national climate goals and resilience targets.</p>
Forests	<p>Vulnerability: forests face degradation from climate-induced forest fires (2,371 incidents in 2022) and land-use changes, threatening biodiversity and ecosystem services within natural resource management.</p> <p>Adaptation measure: initiatives include sustainable forest management, a REDD+ readiness project and</p>	<p>Insufficient funding and limited local capacity for monitoring and managing forest fires are hindering progress.</p>	<p>Thailand has implemented forest fire prevention and control programmes through collaboration with subnational authorities and local communities to enhance forest resilience, reduce climate-related risks and</p>

<i>Priority adaptation sector or area</i>	<i>Vulnerability and adaptation measures reported</i>	<i>Challenges and constraints</i>	<i>Cooperation, good practices, experience and lessons learned</i>
	biodiversity action plans (2023–2027) that integrate ecosystem-based adaptation and strengthen carbon sinks and conservation co-benefits.		support sustainable forest management.
Health ^b	<p>Vulnerability: climate change increases the risk of heat-related, respiratory, cardiovascular and infectious diseases, disproportionately affecting vulnerable groups such as children, the elderly and those with chronic conditions.</p> <p>Adaptation measure: Thailand’s Health National Adaptation Plan 2021–2030 aims to strengthen resilience and reduce climate-related illnesses by improving health literacy, reinforcing primary care, training health officers, developing climate-resilient hospitals, enhancing surveillance with the support of the Geo-Informatics and Space Technology Development Agency and the Thai Meteorological Department, and encouraging community-level actions such as providing dust-free rooms and developing projects to improve environmental health.</p>	Insufficient indicators for monitoring adaptation, limited knowledge on links between climate and health, inadequate research and data systems, budget constraints and challenges in integrating measures into long-term plans and stakeholder engagement are hindering effective climate-resilient health planning and response.	The development of the Phonphai disaster management app and the ThaiAWARE early warning system is an example of cross-sector cooperation involving public health, disaster prevention and multiple agencies to improve emergency response, real-time alerts and public safety in the case of climate-related events.
Infrastructure and human settlements ^b	<p>Vulnerability: infrastructure and human settlements are vulnerable to floods, droughts, storms, saltwater intrusion and sea level rise, with the 2011 flood, which affected the northern, north-eastern and central regions, causing USD 27 billion in damages; rapid urbanization and land subsidence in Bangkok exacerbate the risk of flooding; droughts result in high financial losses and coastal areas face erosion and storm surges.</p> <p>Adaptation measure: adaptation focuses on strengthening preparedness across households, communities and cities through infrastructure upgrades, climate-resilient planning and sustainable practices. Efforts include erecting flood barriers, obtaining renovation loans, increasing green spaces and establishing climate data systems.</p>	Limited financial resources, technical capacity, inter-agency coordination, baseline data and analytical frameworks, alongside long implementation timelines and local climate uncertainties, are constraining the development of resilient infrastructure.	Through the Urban Act project, Thailand is enhancing resilience in the urban transport sector by integrating climate considerations into planning, building capacity and promoting climate-resilient infrastructure.
Poverty eradication and livelihood ^b	<p>Vulnerability: climate change worsens poverty and threatens rural livelihoods in particular as a result of crop failures, water scarcity and extreme weather events, deepening inequality, as highlighted in Thailand’s high Global Climate Risk Index ranking.</p> <p>Adaptation measure: adaptation efforts include agricultural insurance, technology adoption for rice farmers, a focus on sustainable farming practices</p>	Limited access to finance and technology among smallholder farmers, insufficient data on links between climate change impacts and poverty, and challenges in stakeholder engagement are hindering targeted	Thailand’s Doi Tung Development Project led by the Mae Fah Luang Foundation integrates poverty reduction with sustainable land and forest management, supporting over 10,000 people from six ethnic groups through the provision of livelihood support, education and healthcare.

<i>Priority adaptation sector or area</i>	<i>Vulnerability and adaptation measures reported</i>	<i>Challenges and constraints</i>	<i>Cooperation, good practices, experience and lessons learned</i>
Water ^b	<p>and knowledge-sharing to protect livelihoods.</p> <p>Vulnerability: Thailand’s water resources are experiencing fluctuations in availability due to erratic rainfall, severe droughts affecting 42,280 km² over the past decade, floods and saltwater intrusion in 22 major river basins, posing threats to agriculture, industry and consumption. Projections under Representative Concentration Pathways 4.5 and 8.5 indicate further decreases in natural run-off and increased coastal flooding.</p> <p>Adaptation measure: the NAP promotes integrated water management based on river basin principles (upstream, midstream, downstream) and the 20-Year Water Resources Management Master Plan (original plan covers 2018–2037; revision covers 2023–2037) for sustainable use, flood control and ecosystem conservation, supported through real-time monitoring, early warning systems and resilience-building projects in the agriculture and water sectors.</p>	<p>support for vulnerable groups.</p> <p>Limited integration and coordination among agencies, insufficient baseline data and insufficient indicators for monitoring adaptation progress, as well as financial and technical constraints for local implementation and challenges in balancing growing water demand with climate variability, are hindering progress.</p>	<p>Collaboration with the Global Environment Facility has helped fund water management projects, including the Enhancing Climate Resilience in Thailand through Effective Water Management and Sustainable Agriculture initiative. Good practices from community networks such as Ban Lim Thong using flood control and water conservation systems demonstrate local resilience, with lessons learned on integrating early forecasting and stakeholder engagement for sustainable water use.</p>
Tourism	<p>Vulnerability: Thailand’s tourism sector is vulnerable to climate change, with extreme weather events and altered rainfall threatening ecosystems, cultural sites and the 10.6 per cent of the labour force dependent on tourism; a total of 736 destinations face drought risk and 169 face flood risk.</p> <p>Adaptation measure: integrating climate risks into national tourism planning, promoting climate-resilient infrastructure and supporting community-based tourism.</p>	<p>Challenges include limited access to climate data, insufficient funding for resilient infrastructure and low awareness among stakeholders. Coordinating adaptation across diverse tourism destinations and balancing economic growth with ecosystem protection also remain key constraints.</p>	<p>Thailand’s tourism sector has developed good practices through climate-risk integration, community-based tourism and stakeholder capacity-building, highlighting the importance of coordination, resilient infrastructure and local engagement.</p>

^a Rai is a traditional Thai unit of area measurement commonly used for land (1 rai = 0.16 hectares)

^b Thematic target under the United Arab Emirates Framework for Global Climate Resilience.

3. Thailand provided a description of its adaptation strategies, policies, plans and goals; the actions it has taken to integrate adaptation into national policies and strategies; its progress in implementing adaptation action; and information on its monitoring and evaluation of adaptation actions and processes, which is summarized within the context of the iterative adaptation cycle in table I.2.

Table I.2
Summary of information on the iterative adaptation cycle

<i>Dimensions</i>	<i>Information on the progress reported</i>
Impact, vulnerability and risk assessment	Impact, vulnerability and risk assessment: the latest national vulnerability assessment was conducted in 2021. Its findings informed the prioritization of adaptation sectors and the formulation of the NAP and sectoral strategies, particularly in relation to integrating climate risks into key sectors.

<i>Dimensions</i>	<i>Information on the progress reported</i>
	Multi-hazard early warning systems: Thailand’s multi-hazard early warning system was established in 2005 by the National Disaster Warning Center, following the 2004 Indian Ocean tsunami. It has since evolved into ThaiAWARE, launched in December 2021, and integrates national and regional hazard monitoring, decision support and real-time alerts for high-risk areas. The early warning technologies deployed include warning towers, satellite alarm receivers for emergency voice alarm communications, relay stations, broadcasting towers and social media platforms. Key actors supporting system development and enhancement include Thailand’s Department of Disaster Prevention and Mitigation, the National Disaster Warning Center, the Pacific Disaster Center and the United States Agency for International Development. Thailand also prioritizes ‘last-mile’ communication strategies to ensure warnings reach vulnerable communities effectively. To further strengthen outreach, Thailand planned to launch a multilingual cell broadcast service in 2025 to deliver real-time alerts.
Planning	<p>The NAP serves as the central framework for climate resilience across Thailand’s six priority sectors: water resources management, agriculture and food security, tourism, public health, natural resources management, and human settlements and security. Adaptation has been mainstreamed into national strategies such as the Climate Change Master Plan (2015–2050) and the Thirteenth National Economic and Social Development Plan (2023–2027). These plans were developed through a country-driven process led by the Department of Climate Change and Environment, with the engagement of relevant ministries, local authorities, academia and civil society.</p> <p>To enhance gender-responsive adaptation, the Department of Climate Change and Environment has broadened its collaboration with the Ministry of Social Development and Human Security to integrate gender equality, human rights and support for vulnerable groups into climate action planning and implementation.</p>
Implementation	Thailand has made progress in implementing its NAP, particularly in agriculture, water resources and disaster risk reduction. The expansion of early warning systems and climate-resilient farming practices has helped reduce crop losses during droughts and floods. Community-based adaptation initiatives in vulnerable provinces have improved local preparedness and reduced economic disruption from extreme weather events.
Monitoring, evaluation and learning	Thailand is developing a national monitoring, evaluation and learning system to track adaptation progress across its six priority sectors: water resources management, agriculture and food security, tourism, public health, natural resources management, and human settlements and security. The Department of Climate Change and Environment serves as the central coordinating body, supported by sectoral agencies and provincial administrations. Although the monitoring, evaluation and learning system is still evolving, Thailand has laid the groundwork for a robust, iterative approach that enables adaptive management and continuous learning across sectors.

4. Thailand provided information on averting, minimizing and addressing loss and damage related to climate change impacts, as summarized in table I.3.

Table I.3

Summary of information related to averting, minimizing, and addressing loss and damage

<i>Dimensions</i>	<i>Information reported</i>
Observed and potential climate change impacts	<p>Extreme events: observed impacts include significant losses from disasters such as floods, storms, droughts and forest fires. Similarly, projected risks involve the increased frequency of such events, monitored via early warning systems using data from meteorological and hydrological sources.</p> <p>Slow onset events: sea level rise and saltwater intrusion are increasingly affecting coastal agriculture and freshwater resources. The BTR1 references long-term vulnerability assessments and projections conducted under the NAP, which use the best available science to monitor these gradual changes.</p>
Activities	Key activities include the National Disaster Prevention and Mitigation Plan (2021–2030) for systematic disaster risk reduction management, the advancing of funds for emergency relief under the Regulations of the Ministry of Finance (2019) in relation to agriculture, health, housing and occupational rehabilitation, and the dissemination of warnings via 163 satellite receivers, 338 warning towers and apps such as Thai Disaster Alert and DPM Reporter; planned enhancements involve the launch of a cell broadcast service in early

<i>Dimensions</i>	<i>Information reported</i>
	2025 for multilingual emergency alerts. Examples of international cooperation include the development of the Phonphai app (2020), for which the United States Agency for International Development provided assistance related to the Internet of Things, and the development of the ThaiAWARE early warning system (2021) for hazard monitoring.

II. Areas of improvement identified during the technical expert review of the reporting in the Party’s first biennial transparency report on climate change impacts and adaptation under Article 7 of the Paris Agreement pursuant to chapter IV of the modalities, procedures and guidelines

5. The TERT assessed the information reported on climate change impacts and adaptation under Article 7 of the Paris Agreement pursuant to chapter IV of the MPGs in the BTR1 of Thailand and identified areas of improvement relating to consistency with the MPGs, which are described in table I.4. All recommendations and encouragements contained in the table are for the next BTR, unless otherwise specified.

Table I.4
Areas of improvement of the reporting on climate change impacts and adaptation under Article 7 of the Paris Agreement

<i>ID#</i>	<i>Reporting requirement</i>	<i>Description of area of improvement with recommendation or encouragement</i>
I.4.1	Specified in paragraph 107(c) of the MPGs	<p>Thailand did not report transparently in its BTR1 on the methodologies or approaches used to assess potential climate risks and impacts across its six priority sectors: water resources management, agriculture and food security, tourism, public health, natural resources management, and human settlements and security. Furthermore, the lack of information on the uncertainties associated with these assessments makes it difficult to perform a comprehensive sectoral risk evaluation.</p> <p>During the review, Thailand provided information on the development of a spatial climate-risk database in 2021, based on the AR5 framework for assessing hazards, vulnerability and exposure across the six priority sectors. Provincial-level risk indices for drought, floods and heat are based on climate projections and socioeconomic data. To address uncertainties, three models from the fifth phase of the Coupled Model Intercomparison Project and an ensemble were selected, with upgrades under way using the sixth phase of the project. Key challenges include limited technical capacity, a lack of high-resolution subprovincial data and a top-down approach that limits local-level application.</p> <p>The TERT encourages the Party to enhance transparency in future reports by providing more detailed information on the approaches, methodologies and tools used to assess climate risks across the priority sectors, as appropriate. This includes elaborating on the frameworks applied, the treatment of uncertainties, and the technical and institutional challenges encountered, where such information is available. If the Party deems that it is not possible to report consistently with paragraph 107(c) of the MPGs, the TERT encourages the Party to provide an explanation for this in the BTR.</p>
I.4.2	Specified in paragraph 109(c) of the MPGs	<p>Thailand did not report transparently in its BTR1 on how gender perspectives are considered in the prioritization and design of adaptation actions or on how best available science was applied to inform vulnerability assessments and adaptation planning.</p> <p>During the review, Thailand provided information on its efforts to promote gender equality in adaptation-related initiatives. The Party explained that equal participation of all genders has been encouraged in meetings and implementation activities, with specific efforts being made to strengthen the role of women and recognize their contributions. Thailand also noted that, while systematic data collection remains limited, the Department of Climate Change and Environment has broadened its collaboration with the Ministry of Social Development and Human Security to better integrate gender equality, human rights and the needs of vulnerable groups into future adaptation planning and implementation.</p>

ID#	Reporting requirement	Description of area of improvement with recommendation or encouragement
I.4.3	Specified in paragraph 110(c) of the MPGs	<p>The TERT encourages the Party to provide more transparent information on how gender perspectives are integrated into adaptation, for example by reporting more systematic and evidence-based information, including the use of gender-disaggregated data, and on how best available science is systematically integrated into the iterative adaptation cycle and vulnerability assessments, where such information is available. If the Party deems that it is not possible to report consistently with paragraph 109(c) of the MPGs, the TERT encourages the Party to provide an explanation for this in the BTR.</p> <p>Thailand did not report transparently in its BTR1 on how it is implementing adaptation actions identified in past adaptation communications, including efforts towards meeting adaptation needs, as appropriate, owing to a lack of cross-referencing with its adaptation communication submitted through its NC4.</p> <p>During the review, Thailand explained that, as outlined in its NC4 (section 4.4), the adaptation communication submitted through its NC4 presents high-level national adaptation priorities, needs and actions. These were subsequently updated and incorporated into the BTR1. The Party further explained that implementation is progressing across all the adaptation priorities identified in its NC4 (section 4.4). Thailand also expressed its intention to enhance cross-referencing in future reports to enable more systematic and verifiable tracking of adaptation actions.</p> <p>The TERT encourages the Party to enhance the information it reports on its progress towards meeting adaptation needs, including by cross-referencing relevant sections across related documents, such as the adaptation communication and NAP, to enhance the systematic tracking of adaptation actions and to contribute to greater transparency and coherence in reporting.</p>
I.4.4	Specified in paragraph 113 of the MPGs	<p>Thailand did not report transparently in its BTR1 on the effectiveness of the pilot adaptation projects related to monitoring and evaluation, including the extent to which the objectives and expected outcomes of these projects have been achieved. The monitoring and evaluation systems applied, such as tools, frameworks and processes, are not clearly described, nor are the sufficiency of adaptation actions or the indicators and methodologies used to assess resilience. In addition, the BTR1 does not highlight how the outcomes of pilot programmes, including associated co-benefits and trade-offs, are being used to inform other national development planning projects.</p> <p>During the review, Thailand provided information on adaptation implementation across its six priority sectors, including locally driven practices and initial monitoring and evaluation efforts. Thailand reflected on the results of its adaptation projects using questionnaires and an assessment framework based on the evaluation of the projects' context, inputs, processes and products to generate qualitative insights into the projects' context and outputs. Coordination is ongoing to identify relevant indicators. The initial screening of climate resilience metrics has commenced, but standardized methodologies remain under development. The Party explained that it has made some progress in agriculture and water resources. It acknowledged ongoing challenges related to indicator development, data sharing, sectoral readiness, coordination gaps, socioeconomic disparities, capacity constraints and structural constraints within public administration, which are critical areas of improvement.</p> <p>The TERT encourages the Party to improve future reporting by enhancing reporting on methodologies and the assessment of adaptation outcomes, particularly in terms of resilience and vulnerability reduction; clarifying its use of monitoring and evaluation systems, including tools, frameworks and indicators; and highlighting links to national development planning projects and the Sustainable Development Goals, including co-benefits and trade-offs.</p> <p>If the Party deems that it is not possible to report consistently with paragraph 113 of the MPGs, the TERT encourages the Party to provide an explanation for this in the BTR.</p>

III. Assistance in identifying capacity-building needs¹

6. In order to facilitate continuous improvement of the reporting in the BTR on climate change impacts and adaptation under Article 7 of the Paris Agreement pursuant to chapter IV of the MPGs, the following capacity-building needs were identified during the review:

(a) Establishing a centralized national climate information centre to strengthen in-house expertise across relevant agencies, improve access to high-resolution downscaled climate data and integrate bottom-up approaches to enable more granular and actionable risk assessments;

(b) Establishing a centralized climate-health database that consolidates inputs from multiple data sources to enable regional and hazard-specific analysis. This also includes the enhancement of technical capacity in database management, methodologies and climate-health analytics, as well as improved institutional coordination and long-term system maintenance;

(c) Strengthening institutional and technical capacity to systematically integrate gender perspectives throughout the adaptation cycle;

(d) Strengthening institutional capacity to design, implement and report on robust monitoring and evaluation systems. This includes developing indicators aligned with national and sectoral priorities, assessing the effectiveness of adaptation actions, enhancing technical capabilities across agencies to operationalize monitoring and evaluation frameworks, and establishing feedback mechanisms to support iterative adaptation planning and reporting;

(e) Providing technical assistance and collaborating to develop a robust loss and damage assessment system, including the co-development of country-specific economic damage functions and climate impact models. The strengthening of institutional and technical capacity is also needed to assess economic and non-economic impacts, improve data-collection and risk-assessment methodologies, and conduct post-disaster needs assessments.

¹ As per para. 146(e) of the MPGs.

Annex II

Documents and information used during the review

A. Reference documents

BTR1 of Thailand. Available at <https://unfccc.int/first-biennial-transparency-reports>.

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B. Additional information provided by the Party

Responses to questions during the review were received from Oranuch Ketsungnoen (Ministry of Natural Resources and Environment of Thailand), including additional material. The following references were provided by Thailand and may not conform to UNFCCC editorial style as some have been reproduced as received:

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