CTCN
CLIMATE TECHNOLOGY CENTRE & NETWORK

Instructions to lead Implementers for drafting the Technical Assistance Closure and Data Collection Report

Objective of the technical assistance (TA) Closure Report and Data Collection Report:

- To communicate publicly in one synthesis document a summary of progress made and lessons learned under the technical assistance (TA) towards the anticipated impact (main template).
- Compile TA-specific information required for internal use in donor and UN reporting (annex 1).

Steps for completing the TA Closure report:

1. The lead TA implementer drafts the report at the end of the assignment as a final deliverable /product. The TA Closure report will capture all activities conducted under the TA hence it is expected that duplication of information will occur from earlier documents. Please copy and summarise relevant material from previous TA outputs/deliverables and the Response Plan, as relevant.
2. A CTCN Manager will review and revise the report before final approval by the CTCN Director.

Important note on public and internal use of the closure report:
Once approved by the CTCN Director, the TA Closure and Data Collection Report will be a public document available on the CTCN website. Annex 1 is for internal use only and will not be publicly available.

Closure and Data Collection Report for CTCN Technical Assistance

1. Basic information

Title of response plan	**Fast Technical Assistance for GCF Readiness Proposal for Thailand**
Country / countries	**Thailand**
NDE focal point and organisation	
Proponent focal point and organisation	**CTCN**
Sector(s) addressed	**Buildings, Energy efficiency**
Technologies supported	1. GHG modeling, 2. Financial modeling 3. Implementing mechanism of code
Implementation period and total duration	**1 working month within June-November 2018**
Total budget for implementation	**USD15,000**
Designer of the response plan	
Implementer of response plan	

2. Summary of all activities, outputs and products that contribute to the expected impact of the technical assistance.

Description of delivered outputs and products as well as the activities undertaken to	The purpose of the technical assistance was to support the CTCN in addressing comments received on the Readiness and Preparatory Support

achieve them. In doing so, review the log frame of the original response plan and refer to it as appropriate	Proposal "Enabling readiness for up scaling investments in building, energy efficiency for achieving NDC goals in Thailand" submitted by the Thailand NDA to the GCF with the support of the CTCN. The activities undertaken were: 1. Providing technical assistance in determining the share of buildings in total GHG mitigation potential as committed in Thailand's NDC through energy efficiency and integration of RE, and to develop a financial methodology to access the implementation potential of various technologies present in market to enhance energy efficiency in building sector. 2. Carrying out institutional assessment of current enforcement mechanism present to enforce BEC in Thailand, suggesting and describing the roles of various agencies responsible for implementing BEC and summarizing the challenges in implementing BEC In response to the above activities, a desk based research of available data in public domain was carried out. The reports submitted in response to the above activity are as summarized below: 1. An overview along with diagram showcasing the potential of GHG mitigation from the buildings sector through energy efficiency and integration of RE 2. Overview of costing methodology to access the implementation possibility of various new technologies, enhancing the energy efficiency in the building sector 3. Summary of enforcement mechanism present to enforce BEC in Thailand, highlighting the role of DEDE, EGAT, PCD along with summary of challenges present in enforcement of BEC
Partners organisations	NA
Beneficiaries	Thailand NDE
Methodologies applied to produce outputs and products	Desk based research, cost benefit analysis, developing MRV
Deviations	NA
Achieved or anticipated gender benefits from the TA	NA
Achieved or anticipated co-benefits from the TA	NA
Anticipated follow up activities and next steps	The responses to the assigned objectives were integrated with the original proposal submitted to GCF and were used as response to comments received from GCF

3. Lessons learnt

	Lessons learnt	**Recommendations**
Lessons learnt for this TA. Describe essential factors contributing to successful implementation, as well as specific challenges. Recommendations include considerations on what would	Specific challenges resulting to successful implementation of the TA will be in form of electricity data collection, preparing list of existing HVAC	1. Collect building typology specific information (energy details, electricity details, technologies in place) from audits

need to be in place for increasing success of similar efforts (i.e. regulatory, legal, stakeholders, communication, etc.)	technologies in place. Also, although BEC is mandatory in Thailand for new buildings, there in no regulatory mechanism present to check the compliance	conducted earlier and conduct building typology specific audits to verify the results. 2. Put in place a regulatory mechanism for checking compliance to BEC and legal actions to be taken in case of non-compliance 3. BEC is only applicable to new construction, therefore detail out strategy to implement it on existing buildings as well
Lessons learnt related to climate technology transfer Describe opportunities, challenges and barriers for the use and deployment of the technology or technologies supported by the TA. The objective is to identify specific success factors for technology transfer	*The BEC looks into different building usage varying from HVAC, lighting, solar water, RE and building envelop. Although BEC is mandatory it has still not been fully implemented in Thailand, therefore there lies enough opportunity to learn success stories from other countries and implement them in Thailand. The barrier could be in form* *1. Market availability* *2. Upfront cost* *3. Requirement of skilled labour*	*Technology is ever evolving, since BEC looks into all building usage components, advance technologies relevant HVAC, lighting, building material and integration of RE with buildings can be adopted through technology transfer.*
Lessons learnt related the CTCN process for TA		

4. Illustration of the TA and photos

For communication purposes, please provide 2-4 Power Point slides with illustrations or charts showing the TA process, applied methodology, activities, outputs and achieved results. The illustrations must be copied into the TA Closure report but must also be delivered as power point files. Also, please provide at least five high-resolution pictures in jpg format, capturing technical assistance. The pictures should illustrate how the TA has impacted the lives of the beneficiaries in particular and the communities in general.

5. Information for TA impact description

The information in the table below will be used to produce the CTCN TA Impact Description.
The TA Impact description is a 2-page summary document for communication purposes.
Please copy information from sections above and technical delivery reports as required.

Challenge: Approx. 500 characters with spaces	
CTCN Assistance: 2 to 4 bullet points. Approximately 450 characters with spaces	The outputs expected from the CTCN technical assistance will aid Thailand in determining the potential of commercial building included under BEC in meeting the NDC target as committed by Thailand. It will also help in developing more rigorous mechanism for enforcing BEC in the select buildings along with determining the upfront financial investment required for both energy efficiency and integration of RE with buildings
Anticipated impact: 2 to 4 bullet points to summarise anticipated impact. Approximately 250 characters with spaces. As a minimum, please include one of the following: i) Quantity of greenhouse gas emissions reduced, avoided or sequestered; or ii) Number of people with increased capacity to adapt to the impacts of climate variability and change.	The quantity of GHG which could be avoided is 20mtco$_{2e}$ by the 2030 timeframe as defined in the Thailand NDC.
Linkages and contribution to NDC: 2 to 4 bullet points. Approximately 350 characters with spaces	Thailand's Nationally Determined Contribution (NDC) submitted in 2015 at COP 21 in Paris intends to reach a target of 20% reduced GHG emissions from the projected business-as-usual baseline by 2030. Through the EEP of 2015 Thailand is striving to meet GHG emissions reduction targets previously submitted to the UNFCCC in COP 20. Through the current TA it has been estimated that only through energy efficiency improvements and integration with RE technology in five typologies of the building under BEC, Thailand can mitigate 20mtCO$_{2e.}$
The narrative story: Approximately 1200 characters with spaces	The building sector offers great potential for energy savings and GHG emissions mitigation in Thailand. Assessing the existing energy efficiency programmes implemented under the Alternative Energy Development Plan (AEDP) and Energy Efficiency Development Plan (EEDP 2011–2030), Thailand has adopted both compulsory and voluntary measures as a strategic approach to achieve its energy efficiency and sustainable development goals (Chirarattananon, Chaiwiwatworakul, Hien, Kubaha, & Kubaha, 2016). The measures are formulated to enhance building energy performance and to expedite the use of energy efficient technologies and adoption of renewable

	energy in buildings. They are implemented through various regulatory regime and programmes such as ministerial regulation on building design for energy conservation, mandatory building energy efficiency labelling for new government buildings, compulsory mechanisms for large commercial building to install solar hot water system, home energy efficiency labelling, etc (ONEP, 2015). The residential and commercial building sector is responsible for 53% of electricity consumed country-wide (Pantong, Chirarattananon, & Chaiwiwatworakul, 2011). About half of the 53% electricity generated is consumed by large commercial buildings, which include offices, schools, department stores, condominiums, hospitals, hotels, hypermarkets, and other buildings. The increasing number of large, commercial buildings utilizing climate control technologies in Thailand is energy intensive, and the Thai Government foresees that energy demand for buildings will increase substantially in the next 20 years. This higher demand for power generation and expected reduced energy resources supports concerns for future energy security. The electricity consumption of large commercial buildings in metropolitan areas is increased annually from 8,756 GWh/year in 2002 to 11,127 GWh/year in 2009 (King Mongkut's University Technology Thonburi, 2014). The electrical consumption of large commercial buildings in provincial area is lower than that in metropolitan but its growth rate is significantly higher. In provincial area, the consumption share of offices, hotels and department stores are quite comparable, amounting to 67% of total electricity consumption of large commercial buildings in provincial area (5,505 GWh in 2007). Although the electrical use of condominium and hyper markets in provincial area are rather small compared to the three buildings above but their consumption growths are high, up to almost 12% per year (King Mongkut's University Technology Thonburi, 2014). Through the current TA it has been estimated the energy efficiency improvements along with integration with

	RE can mitigate 20mtCO_{2e}
Contribution to SDGs: Always include contribution to SDG 13, and to the extent possible, please include contribution to 2 other SDGs, describing the contribution with a few sentence for each SDGs concerned. A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/	**SDG 7:** The technical assistance aims to strengthen the BEC. One of the building performance indicators included in the BEC is renewable energy utilization in public building contributing to the goal 7 "Affordable and clean energy". **SDG 11:** The improvement of the energy efficiency of public buildings will contribute to the goal 11 "Sustainable of cities and communities". **SDG 13:** The technical assistance supports the implementation of Thailand's Nationally Determined Contribution (NDC) with a target of 20% reduced GHG emissions from the projected business-as-usual baseline by 2030, contributing to the goal 13 "Climate action".

Note: Please see example of a TA Impact Description at the following link: https://www.ctc-n.org/sites/www.ctc-n.org/files/benin_a_ag_forestry.final_.pdf

Annex 1 (for internal use in donor and UN reporting)

A. Standardised CTCN performance indicators for donor and UN internal reporting
Please add quantitative values for indicators relevant to the particular TA in the list below. Non-relevant indicators should be left blank. Please only fill in the table for activities and outputs conducted or produced directly by the CTCN assistance.

CTCN standardised performance indicators	**Quantitative value**	**Qualitative description** *List the various elements corresponding to the quantitative value*
1. Overview		
Number of active person-days (not full duration) of technical assistance provided to counterparts or stakeholders by international experts and consultants	**30**	1. An overview along with diagram showcasing the potential of GHG mitigation from buildings sector through energy efficiency and integration of RE 2. Overview of costing methodology to assess the implementation potential of various new technologies enhancing the energy efficiency in the building sector 3. Summary of enforcement mechanism present to enforce BEC in Thailand highlighting the role of DEDE, EGAT, PCD along with summary of challenges present in enforcement of BEC
Number of active person-days (not full duration) of technical assistance provided to counterparts or stakeholders by national experts and consultants		
Number of for external communication and outreach activities conducted to showcase the assistance (news release, newsletters, articles on website, etc.)		
2. Events (other than trainings) held as part of the assistance		
Number of international and multi-country (at regional or sub-regional level) technology and knowledge sharing events		
Number of participants in the events above		
Number of national technology and knowledge sharing events		
Number of participants in the events above		
Number of public-private events related to technologies		

Number of participants in the events above		
3. Training and capacity building activities conducted during the assistance		
Number of training sessions and capacity strengthening activities		
Number of people who received the training		
Number of men		
Number of women		
Total number of organisations trained		
Number of research organisations, laboratories and universities		
Number of private companies		
Number of cities and local government		
Number of communities		
Number of ministries		
Number of specialised governmental institutions		
Number of non-profit organisations		
Level of satisfaction of participants after the training (from training feedback form). Categories include: From very satisfied, satisfied, partly not satisfied, not satisfied at all		
Percentage of participants that increased their capacities thanks to the training (from training feedback form). Categories include: Significantly, very, moderately, to none.		
Percentage of men		
Percentage of women		
4. Tools, technical reports and information material supported by the assistance		
Total number of tools, technical reports and information material supported by the assistance (excluding mission, progress and internal reports)	**1**	The assistance supported the finalisation of a Readiness and Preparatory Support Proposal "Enabling readiness for up scaling investments in building, energy efficiency for achieving NDC goals in Thailand" submitted by the Thailand NDA to the GCF with the support of the CTCN.
Number of tools strengthened, revised or developed		
Number of technical reports strengthened, revised or created	**4**	
Number of other information materials strengthened, revised or created		
5. Policies, laws and regulations supported by the assistance		
Number of policies, strategies, and plans drafted addressing climate change adaptation		
Number of policies, strategies, and plans drafted addressing climate change mitigation		
Number of documents developed to inform other policies, strategies, and plans on climate change adaptation (sectoral strategies, national development plans, etc.)		

Number of documents developed to inform other policies, strategies, and plans on climate change mitigation (sectoral strategies, national development plans, etc.)	**4**	The technical reports prepared during the assistance supported the finalisation of a Readiness and Preparatory Support Proposal "Enabling readiness for up scaling investments in building, energy efficiency for achieving NDC goals in Thailand" submitted by the Thailand NDA to the GCF with the support of the CTCN.
Number of laws, agreements, or regulations drafted addressing climate change adaptation		
Number of laws, agreements, or regulations drafted addressing climate change mitigation		
Number of documents developed to inform laws, agreements, or regulations on climate change adaptation		
Number of documents developed to inform laws, agreements, or regulations on climate change mitigation	**4**	The technical reports prepared during the assistance aim to strengthen the Thailand Building Energy Code (BEC) through the Readiness and Preparatory Support Proposal "Enabling readiness for up scaling investments in building, energy efficiency for achieving NDC goals in Thailand", submitted by the Thailand NDA to the GCF with the support of the CTCN.
6. Institutional strengthening supported by the assistance		
Number of institutional arrangements in place to coordinate near and long-term national adaptation plans (NAPs)		
Number of organisations with increased technical capacity to advance near and long term national adaptation plans (NAPs) which integrate EbA		
Number of organisations with increase awareness and knowledge among countries to better own and drive national adaptation planning processes		
7. Partnerships and cooperation		
Number of private companies directly engaged in the assistance (that partnered with the proponent, the beneficiaries or the CTCN to implement the assistance)		
Number of South-South collaboration enabled during or through the assistance, when stakeholders from other countries were involved in the assistance		
Number of North-South collaboration enabled during or through the assistance, when stakeholders from other countries were involved in the assistance		
Number of Triangular collaboration enabled during or through the assistance, when stakeholders from other countries were involved in the assistance		

B. Indicators of anticipated impacts that may occur after the TA is completed

CTCN standardised performance indicators	Quantitative value Insert the request value and unit	Content List the elements included in the number provided	Expected timeline Indicate when the indicator and value are expected to be achieved	Responsible institution Indicate the institution(s) that will play leading role in enabling the indicators and anticipated values to be achieved
16. Anticipated finance mobilised				
a) Anticipated amount of public/donor investment mobilised (in USD) from the beneficiary country for climate change activities as a result of the TA	NA			
b) Anticipated amount of public/donor investment mobilized (in USD) from international and regional sources for climate change activities as a result of the TA	US $243,590	The assistance supported the finalisation of a Readiness and Preparatory Support Proposal "Enabling readiness for up scaling investments in building, energy efficiency for achieving NDC goals in Thailand" which request for a $243,590 grant from the Green Climate Fund.	2019	Thailand NDE and NDA.
c) Anticipated amount of private investment mobilised (in USD) from the beneficiary country for climate change activities as a result of the TA				
d) Anticipated amount of private investment mobilised (in USD) from international and regional sources for climate change				

activities as a result of the TA				
17. Policies				
a) Anticipated number of policies, strategies, plans, addressing climate change mitigation officially proposed, adopted, or implemented as a result of the TA				
Anticipated number of policies, strategies, plans, addressing climate change adaptation officially proposed, adopted, or implemented as a result of the TA.				
b) Anticipated number of laws, agreements, or regulations addressing climate change mitigation officially proposed, adopted, or implemented as a result of the TA.				
Anticipated number of laws, agreements, or regulations addressing climate change adaptation officially proposed, adopted, or implemented as a result of the TA.				
c) Anticipated laws, policies, regulations, strategies and plans where climate change mitigation will be mainstreamed as a result of the TA				
Anticipated laws, policies, regulations, strategies and plans where climate change adaptation will be mainstreamed as a result of the TA				
18. Anticipated number of public-private partnerships created				
19. Anticipated twinning arrangements created as a result of the TA				
20. Anticipated number of technology projects prepared and implemented to support action on low emission and climate-resilient development	1			The Energy and Resources Institute
21. Anticipated number of strengthened National Systems of Innovation and technology innovation centres in recipient country				

22. Anticipated Clean Energy Generation Capacity Clean supported by the TA that has achieved financial closure				
23. Anticipated and projected GHG reductions. Quantity of greenhouse gas (GHG) emissions, measured in metric tons of $CO_{2\text{-}e}$, anticipated to be reduced or sequestered as a result of projects supported by the TA	20mtCO_{2e}	The building sector holds potential of mitigating a cumulative of 18 mtCO2 by 2030 over 2011 baseline through energy efficiency. PV installations/renewable energy will contribute to mitigating a cumulative 2mtCO2. Therefore, the total potential of mitigating CO2 from the building sector is 20 mtCO2 by 2030 over the 2011 baseline.	By 2030	The government of Thailand
24. Anticipated clean energy generation capacity supported by the TA that has achieved financial closure				
25. Anticipated and projected greenhouse gas emissions reduced or avoided through 2030, in metric tons of $CO_{2\text{-}e}$, from adopted laws, policies, regulations, or technologies related to clean energy/sustainable landscapes as a result of the TA				
26. Anticipated number of people improving their livelihood as co-benefits as a result of the TA				
27. Anticipated technology types effectively deployed in the country				
28. Anticipated UNFCCC processes implemented as a result of the TA				

(NAMA, NAPA, NDC, etc.)				
29. Anticipated Technology Needs Assessments (TNA) and technology Action Plans (TAP) as a result of the TA				
30. Anticipated cooperative research, development and demonstration programmes within and between developed and developing country Parties facilitated as a result of the TA				
31. Anticipated improved climate change observation systems and related information management in developing country Parties.				