UN environment programme

CTCN UN Climate Technology Centre & Network

Technical Assistance Response Plan – Terms of Reference

Country	**Ghana**
Request ID#	**2022000034**
Title	**Development of Green Building Guidelines and Standards for Ghana**
NDE	**Environmental Protection Agency** P.O. Box M326, Accra-Ghana Joseph Amankwa Baffoe, Ag. Director jabaffoe@gmail.com
Proponent	**Environmental Protection Agency**
Other counterparties	

Summary of the CTCN technical assistance

The energy sector is currently the largest contributor to total GHG emissions in Ghana, accounting for 36% of emissions in 2016. The built environment, including residential, office and commercial buildings are important sources of GHG emissions under this sector. Due to a lack of mandatory building standards in urban and rural areas, the increase in urban sprawl has seen the development of infrastructure which is not environmentally responsible and sustainable across the nation.

Ghana is constrained by an inability to fully implement sustainable building practices, adopt environmentally friendly technologies, and put appropriate measures in place to respond to climate change requirements. This is largely attributed to a lack of institutional and financial resources. Ghana needs to develop sustainable building practices, to improve the environmental and economic performance of new and existing commercial, office, and residential buildings.

This technical assistance seeks to help Ghana in the development of effective green building standards, policy guidelines and Monitoring, Verification and Enforcement (MV&E) frameworks to introduce sustainable building practices nationwide highlighting the use of local building materials.

Agreement:

(If possible, please use electronic signatures in Microsoft Word file format)

National Designated Entity to the UNFCCC Technology Mechanism
Name: Joseph Amankwa Baffoe
Title: Ag. Director
Date: 17th April, 2023
Signature:

Proponent (signature of the Proponent is optional)
Name:
Title:
Date:
Signature:

Proponent (signature of the Proponent is optional)
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Proponent (signature of the Proponent is optional)
Name:
Title:
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Signature:

UNFCCC Climate Technology Centre and Network (CTCN)

Name: Rajiv Garg
Title: CTCN Director (a.i.)
Date: 20 April 2023
Signature:

Technical Assistance Response Plan – Terms of Reference

1. Background and context

Ghana is a lower-middle-income West Africa nation that contributes 0.1% to global greenhouse gas emissions and falls in top climate-vulnerable countries in Africa. Ghana's total greenhouse gas emissions stood at 58.56 MtCO2e (million tonnes carbon dioxide equivalent) in 2019 and are 16% more than the 2016 levels. The mean annual temperature has risen by 1.0oC since 1960. Carbon dioxide has increased by 82%, Nitrous oxide by 22% and Methane by 16%. The mean annual temperature has risen by 1.0 °C since 1960. The number of 'hot' days per year has increased by 13.2%, while the number of 'hot' nights per year has increased by 20%. 'Cold' days and nights per year have decreased by 3.3 and 5.1% respectively. In the period 2005 – 2010, the duration between start and end of rains varied by as much as 30% from year to year. Sea Surface temperatures are rising, as well as incidents of coastal flooding. Climate change is a serious threat to the country's ambition of "Ghana with Aid". It is already affecting economic output, livelihoods and, therefore, long-term development prospects, even though Ghana's own contribution to global climate change has been negligible. The impacts of climate change in Ghana are being felt throughout all sectors of the economy, including the built environment sector.

Ghana's building and construction industry is failing to properly meet the sustainability or green demand. Green buildings have been and continue to be the one recurring topical issue in the country among various stakeholders to hold the keys to reducing our energy demand and consumption, enhancing life through sustainable waste management as well as reducing adverse environmental impacts posed by our built environment sector. Throughout the entire country, and especially in the densely populated urban areas, construction is developing at a rapid pace to meet the rising demand. The design, construction and operation of the buildings are putting increasing stress on the country's energy, water and sanitation systems, the materials used in the construction process, the landfills used as a repository for the waste generated by the building and demolition activities, and on the land itself. The social systems are also under stress, in the form of increased traffic and congestion, failing infrastructure, and growing economic disparity between the wealthiest and least wealthy segments of the population. The pressures put on the ecological and social systems are simply unsustainable if continued at their current rate.

Globally, the construction industry alone consumes 50% of all resources, 45% of all Energy and adds to 35% of CO2 emissions. Several developed countries have embraced the Green Building Concept as the most formidable solution to the preservation of their natural resources and cutting down on the negative impacts of construction on the climate and environment. However, uptake of the concept in the Ghana Construction industry is very minimal and not at the desired rate with only four (4) certified green buildings. This creates a fragile environment which undermines Ghana's efforts at realizing the Sustainable Development Goals (SDGs).

In addition to the above problems, the non-adherence to the building regulations and other related regulations (such as Environmental Assessment Regulations) within the built-up sector coupled with an increase of urban sprawl has compounded the effects within the urban cities of Ghana. For example, tropical storms and floods have had devastating effects on the built environment, leaving families homeless, roadblocks, bridges broken, no access to basic services and more importantly life loss. In addition, the general building regulatory frameworks in Ghana does not promote the quest against climate change, as well as the comfort, safety and confidence for s highly productive workforce and their wellbeing. Despite the crucial role of green or sustainable buildings plays in climate change studies consistently highlight the poor demand in Ghana. For instance, Djokoto et al. (2014) report on the lack of demand for sustainable construction in Ghana. Various research indicates that urban Ghana is faced with rapid depletion of environmental resources amidst burgeoning urbanization and climate change.

Accordingly, there is an urgent need to look at domestic systems and modify them through establishing new building systems and practices based on green thinking and applications. As a result, Ghana needs to develop sustainable practices, there is a need to improve the environmental and economic performance of new and existing commercial, institutional, and residential buildings. In order to make green building practices easier to implement, the ultimate goal is to develop technical services and resources for determining the greenness of buildings based on an appropriate green building compliance system.

This will be achieved by developing green building guidelines and standards as an approach in ensuring sustainability within the built environment. The focus will be set on: reduced production of greenhouse gas emissions (particularly carbon dioxide); reduced use of natural resources water, gas and electricity; enhanced usage of local sustainable building materials; reduced waste production and increased recycling; enhanced building occupant health, comfort, and safety; production of renewable resources; collection of water for potable and non-potable uses; and recycling and treatment of sewage and wastewater.

In December 2022, UNEP signed an agreement with UN Habitat under the UNEP led project funded by Germany "Transforming the Built Environment through Sustainable Materials". Under this agreement, the UN Habitat country team in Ghana is leading and coordinating the development of national buildings and construction roadmaps modelled on the global/regional GlobalABC roadmaps through a participatory stakeholder engagement process. This activity is starting and aims to strengthen collaboration and coordination between stakeholders of the buildings and construction value chain in Ghana and align them behind a common vision and plan towards a low carbon, efficient and resilient buildings and construction sector. This roadmap will help strengthening the contribution of the Buildings and Construction sector to achieving Ghana's NDC. The Ministry of Works and Housing is the government counterpart and has nominated a focal point for this activity/project.

In the context of this project, UNEP together with Yale University and some local partners (CSIR/BRRI Ghana, Willow Technologies) have also developed a case study (to be officially released in June 2023) that looks at the status of the residential building material sectors in Ghana and Senegal and the projected pathways to a shift from conventional high to low-carbon building futures.

The CTCN technical assistance for the development of Ghana's green building guidelines and standards will be funded by this same project (Transforming the Built Environment through Sustainable Materials) and direct synergies will be established between this activity and the activities undertaken for the development of the Ghana's National Buildings and Construction roadmap.

2. Problem statement

In terms of policy, currently there is no clear-cut legislation, regulation, or government policy which makes it mandatory for implementation in building developments in Ghana despite numerous policies on housing and development. Lack of government policies/support, lack of building codes on sustainability, lack of government commitment, and lack of legislation. Dadzie and Dzokoto (2013) posited that green building concept would be successful if stakeholders especially government put in place legislation that will require cooperate sustainability policies and also the development of various policy documents to enforce sustainability in all aspects of their development. The effect of lack of government commitment on the implementation of sustainable building in Ghana confirms results from literature (Rohracher, 2001; Osaily, 2010). Also, the success of SC is highly dependent on the commitment of government and the formation of

legislation. Sustainable buildings cannot be successfully implemented without the commitment of government. Since the government is a key stakeholder in the industry, it has to play a major role such as providing the enabling environment for effective implementation of Sustainable buildings. Due to the many benefits associated with sustainable design and construction, governments and their agencies should also spearhead the movement by gradually incorporating sustainable design and construction practices into new construction projects so that private organizations and individuals can emulate (Dadzie & Dzokoto, 2013).

The Ghana Green Building Council (GhGBC) exists as a member-based Non-Governmental Organisation (GHGBC 2016). Its operations since establishment have been largely limited to education and publication of Green Building Council (GBC) as a national framework that will create a combined enabling environment for the construction and execution of sustainable building construction undertakings. However, involvement of the government, the general public and private sectors in GBC is conspicuously absent.

Djokoto et al. (2014) conducted a study on the barriers to sustainable construction in Ghana and report the lack of demand as the key barrier to sustainable construction in Ghana. Similarly, Chan et al. (2018) identifies the high costs of Green Building Technologies. Lack of demand for sustainable products and cultural change resistance as the major challenges to implementation of Sustainable Construction (SC). Cultural change resistance has been documented as a major challenge of implementing SC. The Ghanaian construction industry has operated in a particular style for a long period of time as such it presents itself as a sector which is traditionally very difficult to change especially with respect to construction methods practiced and building materials used. This change resistance results in a lack of demand by clients and stakeholders of construction projects affecting its eventual supply. Williams and Dair (2006) in the same vein identified lack of sustainability measures by stakeholders as by far the most commonly recorded challenge; further they stated that the lack of demand of SC by clients is a commonly recognized challenge.

Lack of government incentives and lack of financing schemes as critical barriers to the adoption of green buildings in Ghana. Darko and Chan (2018) proposed important demand for green building in Ghana strategies to promote adoption of green building technologies with reference to the Ghanaian construction market.

The lack of awareness of professionals, lack of professional knowledge, lack of awareness of clients, lack of awareness of benefits, ignorance or misunderstanding about sustainability, lack of education and knowledge in sustainable design.
Häkkinen and Belloni (2011) stated that green buildings can be hindered by ignorance or a lack of common understanding about sustainability. Williams and Dair (2006) identified in their study that evidence of challenges due to a lack of information was an experience common to most stakeholder groups in the construction industry. In several cases, stakeholders admitted to not being aware of sustainable measures or alternatives that fall within their remit. Similarly, installing sustainable technologies and materials requires new forms of competencies and knowledge, yet it was evident from their research that not all those with responsibilities in this area had the necessary experience or expertise to meet the challenge (William & Dair, 2006). The construction industry is made up of different actors with different interest (clients, consultants and contractors) who have to come and work together as a team in order to ensure the successful completion of a project. There is the need to create and improve awareness and knowledge of incorporating the greening concept into buildings amongst the various actors in the construction industry in Ghana.

Fear of higher investment costs, fear of long Pay-back period, client worries in profitability, ignorance of life cycle cost, lack of financial resources.
The influence of financial challenges on the implementation of sustainable buildings has been well recognized. According to Häkkinen and Belloni (2011), the fear of higher investment costs for

sustainable buildings compared with traditional building and the risks of unforeseen costs are often addressed as challenges for sustainable buildings. Hydes and Creech (2000) opined that these perceived higher costs may be because of increases in the consultant's fees and indirectly from the unfamiliarity of the design team and contractors with SC methods. Even though it is known that sustainable practices in construction are estimated to increase initial capital cost normally in the range of 1 – 25%, this is counterbalanced by humongous savings in the operational costs (Kats & Capital, 2003) and user comfort. The additional financial cost of providing measures to improve the sustainability of construction works has been cited by many researchers as being a major challenge to the realisation of SC (Häkkinen & Belloni, 2011; Nelms et al., 2005; Hydes & Creech, 2000; Larsson & Clark, 2000).

Lack of environmentally sustainable (local) materials, lack of sustainability measurement tools, lack of exemplar 'demonstration project', lack of easily accessible guidance, lack of technical ability, chronic skills and labour shortages as the major challenges to the implementation of sustainable construction.

These challenges are considered technical because they have a direct impact on the successful implementation of SC principles. Rydin et al. (2006) asserted that designers in the construction industry are not confident when the issues of SC design arise. This suggests that professionals within the built environment need to be fully acquainted with SC principles in order to implement it. According to Osaily, (2010), the availability of locally sourced 'green' building products, such as advanced glazing systems etc., proved difficult for many SC projects. Products had to be imported from elsewhere in many cases, either directly by the project team or through a locally approved distributor. A lack of appropriate guidance appeared to exist for designers in the implementation of SC projects. It is important that technical information on SC is made available to design professionals in an appropriate format, and to the contractors ultimately responsible for implementing the design. Access to such information was cited as a challenge to the use of such techniques by Osaily (2010).

Further challenges include:

- Initial and operational cost of sustainable buildings are very high as compared to the conventional buildings
- Buildings that attain sustainable certification should be embossed with the certificate to encourage other building owners
- Learning and skills training on sustainable construction is inadequate in the country
- Commitment level of stakeholders in the industry is very minimal
- Not enough research has been carried out on sustainable development to ascertain its viability and practicality
- Materials and technologies know-how are not readily available in Ghana
- Professionals in the construction industry are not well versed in sustainable building practices

3. Logical Framework for the CTCN Technical Assistance:

(Guidance: Please note that multiple activities lead to one Output, and multiple Outputs lead to one Outcome. There can be several Outputs, but only one Outcome description capturing the CTCN technical assistance. Deliverables are the products or services to be delivered to the NDE/Proponent/CTCN based on the Activities and the Outputs.)

***Objective**:* The objective of this technical assistance is to support the achievement of targets set by the Government of Ghana under various Conventions through the development of the Green Building Standards for Ghana which will ensure an environmentally responsible construction sector and green buildings. The Green Building Standards will also promote positive economic, environmental, health and social benefits through incorporating energy efficiency, efficient water systems and integrated waste management within the design and construction sector. Buildings will include public and urban and rural residential settlements.

Outcome:
Based on the introduced green building standards and their operationalization, Ghana will stimulate a green building and construction sector and thereby contribute to its NDC targets by significantly reducing energy consumption and GHG emissions.

Activities and outputs	Months														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Output 1: Development of implementation planning and communication documents															
Activity 1: *All implementers must undertake the following activities at the beginning and at the end of the CTCN technical assistance.* i) A detailed work plan of all activities, deliveries, outputs, deadlines and responsible persons/organisations and detailed budget to implement the Response Plan. The detailed work plan and budget must be based directly on this Response Plan. ii) Based on the work plan, a monitoring and evaluation plan with specific, measurable, achievable, relevant, and time-bound indicators used to monitor and evaluate the timeliness and appropriateness of the implementation. The monitoring and evaluation plan should apply selected indicators from the Closure and Data Collection report template and enable the lead implementer to complete the CTCN Closure and Data collection report at the end of the assignment (please refer to item iv below and section 14 in the Response Plan).														

iii) A two-page CTCN Impact Description formulated in the beginning of the technical assistance and update/revised once the technical assistance is fully delivered (a template will be provided) iv) A Closure and Data Collection report completed at the end of the technical assistance (a template will be provided). A closure webinar, open to a larger national and international audience, will be held to demonstrate the project results.															
Deliverable 1: i) Detailed work plan ii) Monitoring and evaluation plan iii) CTCN Impact Description iv) Closure and Data Collection report, webinar recording and summary	X X X X														X
Output 2: Introduction of project coordination mechanism															
Activity 2.1: Establish a stakeholder working group Based on the stakeholder mapping conducted by UN Habitat and the multi-stakeholder expert group for the National Buildings and Construction Roadmap, establish a working group composed of relevant stakeholders among governmental institutions at the national and sub-national level, building and construction industry, energy efficiency and renewable energy sector, private sector, civil society, academic institutions, and beneficiaries. The working group or composed of a sub-set of members from the multi-stakeholder expert group. The working group shall maintain a gender balance and an adequate representation from vulnerable groups. It will provide a technical overview and a high-level guidance at every stage of the technical assistance.														
Activity 2.2: Conduct an inception meeting An inception meeting with the multi-stakeholder expert group for the National Buildings and Construction Roadmap will be organized to present the goals, milestones, anticipated deliverables and the role of the working group for the green building guideliens. The inception meeting will be held in-person, depending on the national regulations for in-person meetings at that moment. From these stakeholders, a restrictive working group (up to 8 people) will be created. For this purpose, the members of the working group should have the capacity to take key decisions with regards to the selection of the appropriate technology, and formulation of policy and legislature that will support its use.														

Activity 2.3: Conduct regular working group meetings Regular stakeholder working group meetings (Months 3, 6, 9 and 12) will be held in order to provide input to and validate outputs, including the building and regulatory assessment, and technology and best practice identification (Output 3), the development of green building standards and policy guidelines (Output 4), and the MV&E Framework (Output 5). One of the quarterly meetings will be held in person, depending on the national regulations for in-person meetings at that moment. For the in-person meeting, travel costs and DSA for working group members will be covered. The others will be held virtually for which no DSA will be paid to working group members.															
Deliverable 2: Deliverable 2.1: Terms of reference and proposed list of stakeholders for the working group Deliverable 2.2: Inception meeting report, including agenda and (gender disaggregated) list of participants Deliverable 2.3: Quarterly stakeholder working group meeting reports including agenda and (gender disaggregated) list of participants	X X		X			X			X				X			
Output 3: Assessment of building groups and regulations in Ghana, and diagnosis of technological needs																
Activity 3.1: Assessment of the current performance of building groups and existing regulations As a first step, this activity will assess the technology and energy performance of the three building types: (1) Residential buildings, (2) Office buildings, and (3) Commercial complexes in Ghana. In particular, the performance in terms of cooling, lighting, heating, and insulation will be studied. This will include, inter alia, an assessment of the building envelops, roofing, comfort system and controls, lighting and controls, and rooftop solar PV. As a second step, existing relevant regulations in the building sector will be analyzed.																
Activity 3.2: Identification of international best practices, technologies, and sustainable local building materials																

International best practices, including technologies and regulations, in the building sector related to cooling, lighting, heating and insulation will be reviewed. Focus will be placed on relevant best practices and technologies successfully deployed in the Western African region. Furthermore, an assessment will be conducted to map available energy efficiency and renewable energy technologies and local buildings materials that can help achieve desired energy savings in new buildings and retrofits of existing buildings. Based on this assessment, a database of clean energy technologies and buildings materials relevant for Ghana's energy performance goals and holding an optimal deployment potential on the national market will be created. This database will help finalize energy performance parameters for the revised building codes in a grounded and realistic manner.													
Activity 3.3: Gap analysis and evaluation of savings potential The activity will conduct a gap analysis to identify limitations of existing national policies, laws, regulations, and guidelines, as well as current performance levels of the three building types (residential buildings, office buildings, and commercial complexes) to help the country improve on the implementation of legal and regulatory energy performance provisions, and the adoption of clean energy technologies and building materials. Besides limitations, an evaluation of the savings potential through energy performance provisions and clean energy technologies and building materials will be conducted.													
Deliverables 3:														
Deliverable 3.1: Assessment report on building performance and regulations Deliverable 3.2: Benchmark report on international best practices and technologies Deliverable 3.3: Report on identified sustainable local building materials Deliverable 3.3: Report on gap analysis and savings potential			X	X		X X								
Output 4: Development of green building standards.														
Activity 4.1: Development of draft green building standards and policy guidelines Under this activity, the draft green building standards and related policy guidelines will be developed for the three building types (residential buildings, office buildings, and commercial complexes) to														

cater for building design and evaluation, construction, technology implementation, retrofits, operation, and maintenance. In this context, existing standards, and regulations, will be aligned or integrated with the new green building standards to be developed. The updating of existing building by-laws should also be carried out. The green building codes to be developed will be built on the results of the assessment, benchmark and gap reports of Output 3.														
Activity 4.2: Public consultation process The draft green building standards will be published for public consultation and provision of comments for a period of 2 months (if not required differently by Ghana Standards Authority). At the end of the consultation process, a 1-day validation workshop will be held with a wider group of stakeholders. A maximum of 50 individuals can participate at the workshop. Workshop facilities and supply (food, beverages) will be covered but no DSA or travel compensation can be paid to workshop participants.														
Activity 4.3: Finalization of green building standards and policy guidelines Comments from the public consultation process as well as interactions with the stakeholder working group will be incorporated and a final draft of the green building standards and policy guidelines will be developed. The standards will be submitted to the Ghana standards Authority for official consideration. The policy guidelines will be taken forward by the Ministry of Local Government and rural development.														
Deliverables 4:														
Deliverable 4.1: Draft green buildings standards and policy guidelines Deliverable 4.2: Public consultation report Deliverable 4.3: Final green buildings standards and policy								X		X	X			
Output 5: Development of effective mechanisms and tools for the implementation of building standards														
Activity 5.1: Development of an effective MV&E framework														

To facilitate the successful implementation of the green building standards, a monitoring, verification, and enforcement (MV&E) framework will be developed. The activity will assess MV&E needs and how roles and responsibilities over the green building standards' compliance evaluation, monitoring and enforcement are to be distributed. This also includes the development of a methodology for assessing the energy performance baseline of existing and new buildings, as well as the development of energy audit methodologies and templates.														
Activity 5.2: Development of user manuals This activity will develop user manuals that will help professionals comply with the new green building codes step by step for retrofitting old buildings and for the construction of new buildings. It will contain practical information such as a clean technologies and materials database developed under Activity 3.2, a registry of certified energy auditors by locality and case studies.														
Activity 5.3: Delivery of a training the trainer's programme This activity will include the delivery of a training the trainers programme on increasing the energy efficiency in existing and new buildings, targeting experts (including architects, engineers, constructors, and energy managers) with the objective to capacitate them to provide trainings. It will elucidate the newly developed green building standards and MV&E framework, provide an overview on the clean technologies and materials database (Activity 3.2), highlight cost-benefit opportunities, and provide guidelines on training provision. The training the trainers programme will host a maximum of 20 participants and will take place in person over a period of 3 days, if not otherwise required my national regulations at the time of delivery. An equal participation of women shall be guaranteed.														
Deliverable Deliverables 5: Deliverable 5.1: MV&E Framework Deliverable 5.2: User manuals											X		X	

Deliverable 5.3: Capacity building material, programme report including agenda and (gender															X

1. Resources required and itemized budget: 200,000 USD maximum

Activities and Outputs	**Input: Human Resources** *(Title, role, estimated number of days)*	**Input: Travel** *(Purpose, national vs. international, number of days)*	**Inputs: Meetings/events** *(Meeting title, number of participants, number of days)*	**Input: Equipment/Material** *(Item, purpose, buy/rent, quantity)*	**Estimated cost** *Please accumulate the costing at Activity and Output level and provide an estimated costing range for each activity and the total Response Plan*	
					Minimum	**Maximum**
Output 1: Development of implementation planning and communication documents	IE1: 5 days NE1: 5 days				**USD 3,500**	**USD 3,850**
Activity 1.1: Formulation of i) Detailed work plan, ii) Monitoring and evaluation plan, iii) CTCN Impact Description, iv)					USD 3,500	USD 3,850

Closure and Data Collection report.						
Output 2: Introduction of project coordination mechanism	IE1: 14 days IE2: 8 days NE1: 18 days NE2: 5 days NE3: 6 days NE4: 5 days NE5: 6 days				**USD 39,320**	**USD 43,252**
Activity 2.1: Map relevant stakeholders and establish a stakeholder working group					USD 4,400	USD 4,840
Activity 2.2: Conduct an inception meeting		International travel of 3 days for IE1 and IE2 National travel of 1 day for NE1, NE2, NE3, NE4 and NE5 National travel of 1 day for inception meeting participants	Inception meeting, 1 day, 20 participants (+ 7 consultants)		USD 18,120	USD 19,932

Activity 2.3: Conduct of regular working group meetings		National travel of 1 day for NE1, NE2, NE3, NE4 and NE5 National travel of 1 day for working group	4 quarterly meetings, each 1 day, 20 participants (+ 5 consultants) One of the quarterly		USD 16,800	USD 18,480
		participants	meetings will be in person with international consultants (IE1 and IE2) joining virtually.			
Output 3: Assessment of building groups and regulations in Ghana, and diagnosis of technological needs	IE1: 30 days IE2: 15 days NE1: 30 days NE2: 30 days NE3: 15 days				**USD 37,500**	**USD 41,250**
Activity 3.1: Assessment of the current performance of building groups and existing regulations					USD 12,500	USD 13,750

Activity 3.2: Identification of international best practices and technologies					USD 12,500	USD 13,750
Activity 3.3: Gap analysis and evaluation of savings potential					USD 12,500	USD 13,750
Output 4: Development of	IE1: 23 days IE2: 23 days				**USD 47,920**	**USD 52,712**
green building standards	NE1: 23 days NE2: 21 days NE3: 18 days NE4: 1 day NE5: 7 days					
Activity 4.1: Development of draft green building standards and policy guidelines					USD 24,000	USD 26,400

Activity 4.2: Public consultation process		National travel of 1 day for NE1, NE2, NE3, NE4 and NE5	1 consultation process validation workshop, 1 day, maximum of 50 participants + 7 consultants International consultants will be joining virtually.		USD 15,720	USD 17,292
Activity 4.3: Finalization of green building standards and policy guidelines					USD 8,200	USD 9,020
Output 5: Development of effective mechanisms and tools for the implementation of building standards	IE1: 25 days IE2: 9 days NE1: 25 days NE2: 15 days NE3: 12 days NE4: 25 days				**USD 55,150**	**USD 60,654**
	NE5: 5 days					
Activity 5.1: Development of an effective MV&E framework					USD 11,500	USD 12,650
Activity 5.2: Development of user manuals					USD 6,900	USD 7,590

Activity 5.3: Delivery of a training the trainer's programme		International travel of 5 days for IE1 National travel of 3 days for NE1, NE2, NE3, NE4 and NE5 National travel of 3 days for training the trainers workshop participants	Training the trainers workshop, 3 days, 20 participants (+ 6 consultants)		USD 36,740	USD 40,414
Estimated range of costing for the entire Response Plan					**USD 183,380**	**USD 201,718**

Profile and experience of experts

Based on the required Human Resources identified in section 4 (Resources required and itemized budget) please provide a description of the required profile of all involved experts for the implementation of the CTCN Response Plan.

International experts	
Team leader and energy efficiency technology expert (IE1)	• Master's degree or higher in civil or mechanical engineer with focus on building physics and green building designs • At least 10 years of experience in a lead role in implementing national and international development projects related to energy efficiency in buildings or the development/design of green buildings

	• Experience in carrying out or having been directly involved in at least one assignment of similar nature and complexity close to the present assignment • Experience with coordinating and liaising with multiple national and international stakeholders • Experience with developing building standards and improving energy efficiency in buildings • Experience in Western Africa highly desirable
Legal expert (IE2)	• Master's degree or higher in construction, environmental or energy law • At least 10 years of experience in formulating and revising technical regulations, by-laws and norms • Knowledge of legislative and legal requirements in the construction and energy consumption in buildings sectors highly desirable • Experience in Western Africa highly desirable
National experts	
Energy efficiency and technology expert (NE1)	• Master's degree or higher in mechanical engineering with a focus on energy efficiency and renewable energy or related field • At least 8 years of experience in improving energy efficiency in buildings • Strong familiarity with the context, challenges and opportunities in the building sector of Ghana • Detailed knowledge of buildings related energy systems, locally available building energy efficiency technologies and materials, and existing building planning and construction norms • Experience with developing energy efficiency building standards is desirable
Architect (NE2)	• Bachelor's degree or higher in building construction, architecture or related fields from a recognized university • At least 8 years of experience in the energy efficiency in buildings sector or the development / planning of Green Buildings. • Detailed knowledge of local and regional construction sector trends and requirements, and good knowledge of local construction practices and construction materials Experience with contributing towards developing technical specifications for building standards related to the building envelop

Legal expert (NE3)	• Master's degree or higher in construction, environmental or energy law • At least 8 years of experience in formulating and revising technical regulations, by-laws and norms • Knowledge of national legislative and legal requirements in the construction and clean energy sector
Capacity building and skills development consultant (NE4)	• Bachelor's degree or higher in communication, education, energy, engineering or related fields • At least 8 years of experience in training professionals in the clean energy and/or building and construction sector • Experience in developing manuals and professional training modules • Knowledge of construction requirements and building planning procedures highly desirable
Gender expert (NE5)	• Bachelor's degree or higher in gender studies or related fields • At least 8 years of experience in mainstreaming gender benefits in development programs • Knowledge of energy efficiency and building sectors highly desirable

Technical Assistance Response Plan – Terms of Reference

Intended contribution to impact over time

Please provide a brief description of the intended contribution to impact over time of the outcome and outputs provided by this technical assistance on resilience to climate change and/or carbon abatement. To the extent possible, please quantify the intended impact contribution, for example by indicated estimated number of people potentially impacted over time, GDP contribution of the focus sector, carbon emissions by the focus sector, etc. This intended contribution to impact is what will happen if the objective (as articulated in section 3) is met. Please ensure relevant complementarity with text in sections 7 to 12. (Maximum 1250 characters including spaces).

Green Building Standards for Ghana as part of the targets set by the Government of Ghana under various Conventions, will ensure an environmentally responsible construction sector and buildings. The Green Building Standards will also promote positive economic, environmental, health and social benefits through incorporating energy efficiency systems, efficient water systems and integrated waste management within the design and construction sector.

2. Relevance to NDCs and other national priorities

Please identify relevance and contribution from the technical assistance to the Nationally Determined Contributions (NDC) and other relevant national prioritized efforts (TNAs, TAPs, NAPs, NAMAs, etc.). (Maximum 2500 characters including spaces)

Ghana's NDCs are expected to drive Ghana's efforts to attain a low carbon climate resilience future. As steps to tackle climate change are taken, it is important to be mindful of the trade-offs and the need to adhere to the following principles: (a) ensure environmental integrity and intergenerational equity (healthy citizenry, local air quality, sustainable production, and consumption) and (b) facilitate inclusiveness and make sure the need of diverse interest groups is on brought on board.

Page 26-26, 6.2 Annexe 2: Adaptation and Mitigation Contribution Table11, City-wide resilient infrastructure planning., Promotion of energy efficiency in homes, industry, and commerce., Scale-up renewable energy penetration by 10% by 2030., Adopt alternative urban solid waste management https://unfccc.int/sites/default/files/NDC/2022-06/Ghana%27s%20Updated%20Nationally%20Determined%20Contribution%20to%20the%20UNFCCC_2021.pdf

Based on its national circumstances, Ghana has put forward mitigation and adaptation actions in its INDC. The inclusion of both mitigation and adaptation in the INDC resonate with the medium-term development agenda (Ghana Shared Growth Development Agenda II – GSGDA 2), the anticipated 40-year socio-economic transformational plan and the universal sustainable development goals. In all, 20 mitigation and 11 adaptation programmes of actions 1 in 7 priority economic sectors are being proposed for implementation in the 10-year period (2020-2030). The implementation of the actions is expected to help attain low carbon climate resilience through effective adaptation and greenhouse gas (GHG) emission reduction in the following priority sectors:

•Sustainable land use including food security
•Climate proof infrastructure
•Equitable social development
•Sustainable mass transportation
•Sustainable energy security
•Sustainable forest management; and

• Alternative urban waste management.
Page 2 of 16
https://www.resourcedata.org/dataset/rgi21-ghanas-intended-nationallydetermined-contribution-indc/resource/699786f5-bcd1-4655-845dbca94e6a619c

The Ghana National Climate Change Policy is Ghana's integrated overarching response to the threats of Climate Change. The policy is developed within the framework of Ghana's sustainable development goals and priorities. One of the key areas identified is (4.5) Energy, Industrial and Infrastructural Development Focus Area 10: Minimize Greenhouse Gas Emissions Principles The main principles are that:

- The development of infrastructure and associated facilities has a direct influence on the sustainable development of the nation.
- Incorporating climate-resilient codes into basic infrastructure will significantly reduce the vulnerability of the nation to climate change risks.

One Key Challenge is the Lack of design standards and codes for architects and engineers to design or rehabilitate structures to optimize emission reductions.
(Page 64, Chapter 4, section 4.5) https://www.un-page.org/files/public/ghanaclimatechangepolicy.pdf

The Ghana Shared Growth Development Agenda (GSGDA) was prepared by the National Development Planning Commission to provide a consistent set of development policy objectives and strategies to advance a better Ghana agenda. GSGDA I, spanned the period 2010 to 2013 and GSGDA II, from 2014 to 2017.oone of the Strategic targets with regards to RE is to

- Promote the use and design of energy efficient and renewable energy technologies in public and private buildings; (under Energy Supply to Support Industries and Households)

Pages 27 and 28
https://www.un-page.org/files/public/gsgda.pdf

Ghana's National housing Policy on Sustainability and Resilience (Utilise sustainability principles to guide shelter and human settlement development) dictates that: The state shall ensure that all housing construction are based on principles of sustainability. All new housing shall utilise durable materials in their construction without jeopardising the environment or the viability of the base resources used in their production. New communities shall be developed to also withstand the vagaries of climate change and disasters. Furthermore, all human settlements, aggregating residential, commercial, social, and other functions shall be built on principles of sustainability. Existing communities that have degraded due to poor maintenance of housing and infrastructure will be upgraded to attain the goal of resilience.

Page 11, Chapter 2.1 Guiding Principles https://www.mwh.gov.gh/wp-content/uploads/2018/05/national_housing_policy_2015-1.pdf

3. Linkages to relevant parallel on-going activities:

Please identify relevant previous and ongoing public and private sector initiatives, projects, or programmes that the CTCN assistance will specifically build on and contribute to. To the extent possible, please add practical and operational details on the linkages between existing activities and the CTCN assistance. (Maximum 2500 characters including spaces)

Ghana continues to implement climate change measures in its NDCs and has also introduced significant policy interventions that have development and climate protection goals. These concrete efforts are already yielding positive results, however green building initiatives for the built-up sector largely remains voluntary. Depending on the use, size and type of structure being built however, Environmental Impact Assessments (EIA's) may be required in accordance with the Environmental Regulations (L.I. 1652, 1992).

In 2021 Ghana submitted its third Biennial Update Report with information up to 2020. Ghana continues to implement climate change measures in renewable energy, landscape restoration, clean support cooking, low carbon electricity generation, restriction of gas flaring in the oil and gas industry and sustainable waste management. The country has also introduced significant policy interventions that have development and climate protection goals. The flagship programmes on planting for food and jobs, one-village-one- dam, and the one-district-one-factory aim to boost green industrialisation and rural development and build resilience to the impacts of climate change. The country as it waits for IPCC to complete the methodology work on Short Lived Climate Pollutants (SLCPs), Ghana has voluntarily calculated SLCP emissions using the EMEP/CORINAIR Emission Inventory Guidebook.

Ghana has presented 14 mitigation actions across the energy, forestry, waste, transport and RAC sectors. It covers technology, fiscal and regulatory instruments, capacity development and awareness measures.

Of all the identified measures and projects there are none related to green or sustainable building since in relation to green building in the Ghanaian construction industry, it is a relatively a new concept. The GHGBC as a member-based Non-Governmental Organization (NGO), which is the main organization to coordinate the adoption of green construction in Ghana, was only recently established in 2009 [Ghana Green Building Council (GHGBC), 2010]. Though the panacea to transform Ghana's built environment, yet green building initiatives are plagued with diverse challenges (Ampratwum et al., 2019; Chan et al., 2018). Ghana has not fully embraced the green revolution in construction industry, and still has an industry largely practicing unsustainable traditional construction practices. There has only been disjointed and piecemeal efforts in terms of policies which seek to promote aspects of the green building concept. From 1996, for example, renewable energy policies were formulated under the energy policy framework with the aim to develop indigenous and renewable energy sources from solar, small and medium sized hydro, wind, biomass and municipal solid waste (Energy Commission Ghana, 2006). Government of Ghana again in 2007, upon the advice of the Energy Commission of Ghana (ECG), embarked on a programme which saw them procure and distribute six million energy-efficient compact fluorescent lamps (CFLs) for free as a direct replacement of six million traditional incandescent lamps (ECG, 2009). This was however a one-off measure to mitigate the 2007 energy crisis in Ghana. To act as a coordinating panel, the government also established in 2009 the Sustainable Development Committee (SDC) with representatives from key MDAs and Civil Society (Ministry of Science and Technology, 2012). However, the activities of this committee are largely disjointed.
Currently, three of green buildings rating tools have been used in Ghana. These include the US LEED, Green Star SA and EDGE. The GHGBC is still in the process of finalizing the adaption of the Green Star SA to a localized GB rating system for Ghana called Green Star SA-Gh. Evident from the preceding trace as regards the development of green building of Ghana, it's obvious that, its implementation is being driven by Private sector developers mostly in commercial office and retail buildings rather than government or public bodies. The absence of GB specific regulations and

authoritative GB rating tools which makes it compulsory for all government projects to meet GB standards is to blame for this state of practice in Ghana (Djokoto et al., 2014).
Despite this lack of policy direction, Ghana is one the developing countries which are making strides in promoting the uptake of green building.

- According to the formation of the GHGBC in 2009, the pioneer green building in Ghana was completed in 2012 i.e., the One Airport Square as a pilot project for the adaptation of an international" green" certification procedure in the Ghanaian context (Green Star SA). Designed by renowned sustainability architect Mario Cucinella, one airport square is a nine-storey 20 250m2 building located in Airport City, near Kotoka International Airport, Accra, Ghana. It is the first green commercial office building in West Africa. Key sustainability aspects of the one airport square include; solar building integration, vernacular building strategies, public spaces, renewable building materials, recycling and reuse, ecological building materials, integrated planning process, participation of users in planning process, low-cost design, use of innovative design tools, natural cross ventilation, evaporative cooling, use of high thermal mass, energy recuperation etc. (sbd2050, 2018).
- Further efforts in the journey led to the launch of the Eco-Communities National Framework which is "a vision, set of guided principles, and aspirations serving as the basis for the development of the rating system for communities, neighborhood, and cities development in Ghana", in 2012 by Ghana Green building council (GHGBC, 2012).
- Also, in 2014, the Council moved a step further to practicalising the adoption of green building by adopting the La Bawalashie Presby school complex in Accra to rehabilitate and model it as a

4. Anticipated follow up activities after this technical assistance is completed:

Please describe the expected future use of the outputs and deliveries produced by this technical assistance, after the CTCN implementation is completed, towards contributing to the anticipated impacts over time articulated in section 6. For example, what organizations or stakeholders will use the outputs of the technical assistance after it is completed, for what purpose, at what scale and scope the outputs and deliveries will be applied, when and what will be the next steps undertaken, etc. (maximum 2500 characters including spaces)

Following the completion of the technical assistance, Ghana will conduct the following follow-up activities:

- Adoption of green building standards (if not done already during the runtime of the technical assistance)
- Operationalization of MV&E Framework and training of energy auditors/managers
- Operational usage and distribution of the clean technologies and materials database
- Ongoing capacity building and training on clean technologies and materials database within industry and consumers

5. Gender and co-benefits:

Imbedded in design of the activities:	Capacity Building - Women and men will benefit equitably from technical assistance and related project training

	Advocacy and Conscientizing - Active involvement of all professionals within the built environment, manufacturing industry, user groups in awareness campaigns in a gender responsive way. **Decision making** • equal participation of women and men in decision making. • Equal access to resources related to the green building standards implementation and use. Other anticipated co-benefits that will improve general quality of life include: • capacity and skills enhancement. • Sustainable resource management. • Business opportunities creation. -Increased resilience and reduction in vulnerability. Empowerment of communities in waste management business, such as sale of waste reuse products, waste recycling, waste collection for recycling, waste to energy small scale projects for domestic supplies.
Gender and co-benefits intended as result of the activities:	*Please describe all gender aspects, women's equality and other co-benefits expected because of the CTCN technical assistance.* As a result of the technical assistance, the following co-benefits for women, youth and other vulnerable groups are expected: • Women will gain access to a more reliable energy supply and an improved quality of life • Ongoing capacity building and skills enhancement will be provided to women in the construction sector • Business opportunities for women in the buildings and construction sector will be set forth

6. Main in-country stakeholders in implementation of the technical assistance activities:

Using the table below, please list and describe the role of in-country stakeholders, participants and beneficiaries who will be involved in or directly consulted during implementation of the assistance.

In country stakeholder	Role in implementation of the technical assistance
Environmental Protection Agency *(CTCN NDE)*	Technical assistance coordination, stakeholder engagement, standards shaping and development

Ministry of Environment Science Technology and Innovation, Ministry of Works and Housing, Ministry of Finance	Provide policy direction and guidance on the policy regarding the project. Will work with coordinating institution to ensure the participation of the subordinate organizations involved in the programme for successful implementation.
Ministry of Local Government, Decentralization & Rural Development	Technical assistance coordination, stakeholder engagement, data and research input, standards shaping and development, action planning and operationalization of standards
Ministry of Energy (MoE)	Data and research input, standards shaping and development and providing policy direction and guidance on the policy regarding the project. Will work with coordinating institution to ensure the participation of the subordinate organizations involved in the programme for successful implementation.
Ministry of Trade and Industry	Data and research input, standards shaping and development and providing policy direction and guidance on the policy regarding the project. Will work with coordinating institution to ensure the participation of the subordinate organizations involved in the programme for successful implementation.
Ghana Green Building Council	Technical assistance coordination, stakeholder engagement, data and research input, standards shaping and development
Ghana Standards Authority	Development and adoption of standards
Ghana Chamber of Construction	Stakeholder engagement, action planning and operationalization of standards
Accra and other Municipalities in Ghana Rural District Councils	Standards shaping and development, action planning and operationalization of standards
Ghana Institute of Architects	Standards shaping and development, action planning and operationalization of standards, research, and implementation
Ghana Institution of Engineering	Policy shaping and development, action planning and operationalization of standards, research, and implementation
Development Bank of Ghana	Private sector mobilization and stakeholder input, input into financial measures and instruments to stimulate development of green buildings

Ghana Institute of Urban and Regional Planners	Policy shaping and development, research, and implementation
Private Sector (Manufacturing Industries)	Assisting in the identification of market needs and exploring new economic opportunities, input into financial measures and instruments to stimulate green building uptake
Universities and research institutions	Data and research input, stakeholder engagement
Mass Media in Ghana	Communication and knowledge distribution on standards and green buildings
NGOs and Development Partners	Stakeholder engagement, potential follow-up funding
Energy Commission (EC)	Lead government institution with stator responsibility for energy efficiency and renewable energy in Ghana. Data and research input, standards shaping and development and providing policy direction and guidance on the policy regarding the project. Will work with coordinating institution to ensure the participation of the subordinate organizations involved in the programme for successful implementation.
CSIR-BRRI, Built Environment Division	The CSIR-Building and Road Research Institute is one of the thirteen research institutes under CSIR-Ghana. The mandate of the institute is to provide Research and Development to the building and road sector of the Ghanaian economy. The Institute is currently equipped with state-of-the-art laboratories in the areas of Structural Materials Testing, Geotechnical Investigations, Surveying and Mapping, as well as Geo-informatics. The Institute is open to collaborative research and provision of consultancy services to both public and private entities, as well as international agencies.
Commercial, Development and International Banks	Private sector mobilization and stakeholder input, input into financial measures and instruments to stimulate development of green buildings

7. SDG Contributions:

Technical Assistance Response Plan – Terms of Reference

*Instructions: Please complete the grey section below for **a maximum of three SDGs** that will be advanced through this TA. A complete list of SDGs and their targets is available here: https://sustainabledevelopment.un.org/partnership/register/.*

Goal	Sustainable Development Goal	Direct contribution from CTCN TA (1 sentence for top 1-3 SDGs)
1	End poverty in all its forms everywhere	
2	End hunger, achieve food security and improved nutrition, and promote sustainable agriculture	
3	Ensure healthy lives and promote well-being for all at all ages	
4	Ensure inclusive and equitable quality education and promote life-long learning opportunities for all	
5	Achieve gender equality and empower all women and girls	
6	Ensure availability and sustainable management of water and sanitation for all	
7	Ensure access to affordable, reliable, sustainable, and modern energy for all (consider adding targets for 7)	Implementation of green building standards will contribute towards reducing energy consumption in existing buildings and energy demand in new buildings, thus making energy supply more reliable and sustainable.
	7.1 - By 2030, ensure universal access to affordable, reliable, and modern energy services	Green building standards will facilitate the use of renewable energy and energy efficiency technologies. This will contribute to making the national energy supply cleaner and modern.
	7.2 - By 2030, increase substantially the share of renewable energy in the global energy mix	
	7.3 - By 2030, double the global rate of improvement in energy efficiency	
	7.a - By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology	Implementation of the green building standards will generate new opportunities for international cooperation on energy efficiency and renewable energy technologies.
	7.b - By 2030, expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all in developing countries, least developed countries, small island developing States, and land-locked developing countries, in accordance with their respective programmes of support	
8	Promote sustained, inclusive, and sustainable economic growth, full and productive employment, and decent work for all	

9	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	
10	Reduce inequality within and among countries	
11	Make cities and human settlements inclusive, safe, resilient, and sustainable	
12	Ensure sustainable consumption and production patterns	
13	Take urgent action to combat climate change and its impacts	
	13.1 - Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	
	13.2 - Integrate climate change measures into national policies, strategies, and planning	
	13.3 - Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning	Capacity building and awareness raising activities will facilitate implementation of the green building standards in existing and new buildings, thus contributing to climate change mitigation.
	13.a - Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible	
	13.b - Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth, and local and marginalized communities	
14	Conserve and sustainably use the oceans, seas, and marine resources for sustainable development	
15	Protect, restore, and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss	
16	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable, and inclusive institutions at all levels	
17	Strengthen the means of implementation and revitalize the global partnership for sustainable development	

8. Classification of technical assistance:

Please indicate primary type of technical assistance. Optional: If desired, indicate secondary type of technical assistance.

Please tick off the relevant boxes below	*Primary*	*Secondary*
☐ 1. Decision-making tools and/or information provision	☐	☐
☐ 2. Sectoral roadmaps and strategies	☐	☐
☐ 3. Recommendations for law, policy, and regulations	x	☐
☐ 4. Financing facilitation	☐	☐
☐ 5. Private sector engagement and market creation	☐	x
☐ 6. Research and development of technologies	☐	☐
☐ 7. Feasibility of technology options	☐	x
☐ 8. Piloting and deployment of technologies in local conditions	☐	☐
☐ 9. Technology identification and prioritization	☐	x

Please note that all CTCN technical assistance contributes to strengthening the capacity of in country actors.

9. Monitoring and Evaluation process

Upon contracting of the implementing partners to implement this Response Plan, the lead implementer will produce a monitoring and evaluation plan for the technical assistance. The monitoring and evaluation plan must include specific, measurable, achievable, relevant, and time-bound indicators that will be used to monitor and evaluate the timeliness and appropriateness of the implementation. The CTCN Technology Manager responsible for the technical assistance will monitor the timeliness and appropriateness of the Response Plan implementation. Upon completion of all activities and outputs, evaluation forms will be completed by the (i) NDE about overall satisfaction level with the technical assistance service provided; (ii) the Lead Implementer about the knowledge and learning gained through delivery of technical assistance; and (iii) the CTCN Director about timeliness and appropriateness of the delivery of the activities and outputs.

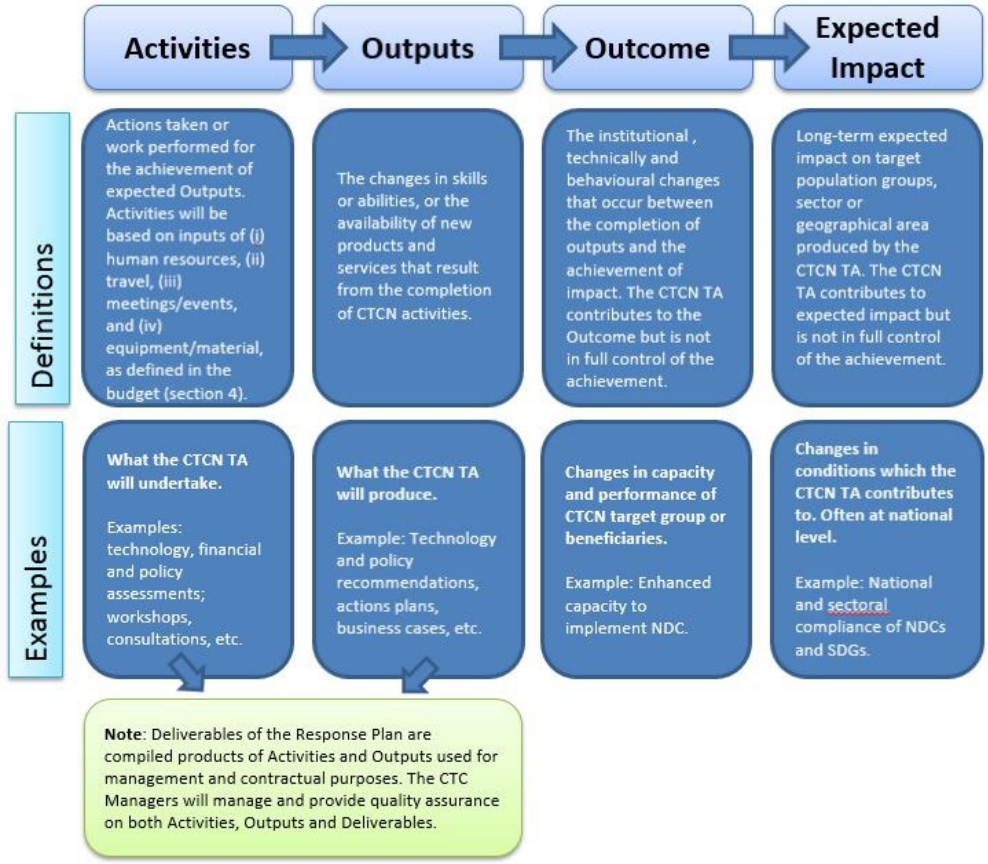
Annex 1: Guidance note for designing a Response Plan (to be deleted when submitting the Response Plan)

1. Objective of the Response Plan

The Response Plan is developed by CTCN specialists in response to a country request for technical assistance. It constitutes the Terms of Reference of the CTCN technical assistance that will be provided to the country, and it provides the formulation of and subsequent basis for the monitoring and evaluation of the Response Plan implementation, as well as its expected outcomes and anticipated impacts.

2. Results chain and Logical Framework Approach to be defined in the CTCN Response Plan

The result chain is the causal sequence that stipulates the necessary flow of actions and processes to achieve desired objectives and results – beginning with inputs, moving through activities and outputs, and culminating in individual outcomes. The outcome will contribute to the desired impact in the society. The Logical Framework Approach is an analytical process used to support objectives-oriented project planning and management. It provides a set of pre-defined concepts which are used as part of an iterative process to aid structured and systematic analysis and management of the CTCN technical assistance.



3. Role of the Response Planning Design Team

The Response Planning Design Team is selected by the Climate Technology Centre (CTC). The composition of the team depends on each request but may include the National Designated Entity (NDE), the request Proponent, Climate Technology Manager of the CTCN, experts from the CTCN Consortium, UNIDO and UNEP experts from regional offices and other experts as needed.

The role of CTCN Consortium experts is to lead the design of the Response Plan. The NDE will provide overall guidance on national context and priorities whereas the request Proponent will provide more detailed information on the sector, barriers and requested assistance. The Climate Technology Manager of the CTCN will provide quality assurance of timeliness and appropriateness of the Response Plan.

The Response Planning Design Team will draft all sections of the Response Plan template building on the information contained in the CTCN Request, based on expertise on the given topic and potentially further data collection, as required. This will be done by the CTCN Consortium Experts in consultation with the NDE, request Proponent and relevant stakeholders. The Response Plan must be agreed to and approved by the NDE and the CTCN Director. This Response Plan will serve as the basis to identify, select, and engage an expert institution from the Climate Technology Network or Consortium to lead the implementation of the CTCN Response Plan in the requesting country.

To the extent possible, staff from UNEP and UNIDO Regional, Sub-Regional and/or National Offices should be involved in all stages of formulation of the Response Plan to maximize synergies and avoid overlap with ongoing initiatives, as well as ensure relevance to regional and national context.

4. Process for designing the Response Plan

The Response Planning process should be completed over a period of up to 60 working days (12 weeks). Indicative steps and related timelines are laid out below:

5. Design Considerations

To maximize the impact of the technical assistance provided by the CTCN and provide an effective M&E process, the Response Plan should integrate as much as possible the considerations below:

Climate Technology focus: The Response Plan should have a clear focus on climate technologies, and identify activities that enable the identification, development, deployment, or diffusion of one or several specific technologies (including equipment, techniques, knowledge, and skills).

Barrier removal / Problem solving: The activities should contribute to address the specific problem statement identified in the Request. The barriers identified should be those hampering the

identification, development, deployment, or diffusion of one or several climate technologies or climate actions. Therefore, it may be necessary to limit the CTCN Response Plan to a set of activities for technical assistance commonly agreed with the NDE (and Proponent when needed) compared to the original request submitted. The CTCN will liaise with NDEs and Proponent in case the scope of the technical assistance deviates from the original request.

Use of the CTCN assistance by stakeholders: The Response Plan should identify clearly how the products of the CTCN assistance will be used in the short term once support is delivered, by who and when, to ensure it will lead to specific impacts in the country. The activities should engage the stakeholders that will use the concrete results of the assistance to deploy the technologies, including from the private sector, the public sector, research institutions, etc.

Within the scope of CTCN resources: The cost of the technical assistance provided by the CTCN cannot exceed USD 250,000 per Response Plan. Therefore, it may be necessary to prioritize activities and limit the CTCN Response Plan to a set of priority activities commonly agreed with the Proponent and the NDE to remain under this value. Under section 4 of the Response Plan template, an indicative activity-based budget should be presented. The proposed budget is indicative and should present an estimated costing range per activity, output as well as a total costing range for the delivery of the Response Plan. Once the Response Plan is finalised and published for tendering, interested parties will provide competitive offer against the indicative budget.

CTCN activities and outputs should be linkable to monitoring and evaluation indicators: All proposed activities and outputs must be linkable to monitoring and evaluation indicators that are specific, measurable, achievable, relevant, and time bound. The monitoring and evaluation process and corresponding indicators will be developed by the Lead Implementer as part of the work plan and will allow the CTCN technology Manager to monitor the timeliness and appropriateness of the implementation.

Synergies with existing efforts: The Response Plan should focus on activities that are not already being fully supported or that are in the process of being fully supported by another national, regional, or international organization. Synergies and complementarity also require that the CTCN assistance is not duplicating past activities. It is possible in the Response Plan to indicate co-financing from the government, the Proponent, or another stakeholder, that will maximize the effectiveness of the CTCN assistance.

Gender mainstreaming: The CTCN mission is to build or strengthen developing countries' capacities to identify technology needs, to facilitate the preparation and implementation of technology projects and strategies considering gender considerations. The Response Plan must therefore describe how gender considerations will be included and monitored within the proposed activities, and any gender co-benefits that will be gained because of implementing the CTCN technical assistance.