**Guidelines:**

- This Request Submission Form should be completed by the organisation requesting technical assistance from the Climate Technology Centre & Network (CTCN) in collaboration with the National Designated Entity (NDE) of the country in question
- The Form must be signed by the NDE. Please see updated contact list of NDEs here: http://unfccc.int/ttclear/support/national-designated-entity.html
- The Form can be submitted as a Word file containing a digital signature or as a signed and scanned PDF file in combination with an un-signed Word file
- For requests submitted by multiple countries, all the NDEs of the respective countries shall sign identical Forms before official submission to the CTCN
- NDEs have the opportunity to submit CTCN requests in collaboration with National Designated Authorities (NDAs) for the Green Climate Fund (GCF) if targeting the GCF Readiness Programme.

| | |
|---|---|
| **Requesting country or countries:** | Ghana |
| **Request title:** | DEVELOPMENT OF GREEN BUILDING GUIDELINES AND STANDARDS FOR GHANA |
| **NDE** | Please add name of organisation, name of individual, position, email and address.<br>Joseph Amankwa Baffoe, Ag. Director<br>Environmental Protection Agency, P.O. Box M326, Accra-Ghana<br>jabaffoe@gmail.com |
| **Request Applicant:** | Environmental Protection Agency |

**Climate objective:**

- ☐ Adaptation to climate change
- ☐ Mitigation of climate change
- ☒ Combination of adaptation and mitigation of climate change

**Geographical scope:**

- ☐ Community level
- ☐ Sub-national
- ☒ National
- ☐ Multi-country

If the request is at a sub-national or multi-country level, please describe specific geographical areas (provinces, states, countries, regions, etc.).

**Problem statement related to climate change** (up to one page):

This section should answer the question “what is the problem?” Please summarise the problem related to climate change and/or the negative impacts of climate change in the country that the request aims

to address.

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 researches indicates that urban Ghana is faced with rapid depletion of environmental resources amidst burgeoning urbanization and climate change.

There is therefore the need to develop a more sustainable framework and regulations as an approach

in ensuring sustainability within the built environment. The focus will see to it that buildings: reduced production of greenhouse gas emissions (particularly carbon dioxide); reduced use of natural resources, in particular, water, gas and electricity; 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.

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).

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.

**Past and on-going efforts to address the problem** (up to half a page):

This section should answer the question "what has been done or is currently being done to address the problem?" Please describe past and on-going processes, projects or initiatives implemented in the country or region to tackle the climate problem as described above.

In 2021 Ghana submitted its third BUR 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. Our 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 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 Ghana Green Building Council (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, its 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 largely to blame for this state of practice in Ghana (Djokoto et al., 2014).

Projects and Initiatives:

Despite this seemingly lack of policy direction, Ghana is one the developing countries which are making strides in promoting the uptake of green building.

- After 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, in close proximity to 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

green school using the GB principles. This project is dragging for lack of funds.

- The green building revolution in Ghana was the start in 2014 of Africa's first LEED for Health care- Silver category building; the New Ridge Hospital located in Accra, Ghana. The five-story, 465,560-square-foot hospital was designed by Perkins + Will in Miami as the architect, in collaboration with Bouygues Bˆatiment International in Saint-Quentin-en-Yvelines in France as the general contractor was completed and commissioned in 2016. Key sustainability aspects of the Ridge hospital is described to include; long and stout layout of the building, with a large walkable ramp that connects the four stories of the hospital, cisterns installed underneath the building to collect and store water, natural ventilation for the facility, with naturally cooled breezeways, ventilated waiting areas, and outdoor rooms for large groups, solar hot water heater was installed to make the facility less dependent on electricity, plus the major part of the hospital is powered by solar energy, and there is an emergency generator in place to power the entire hospital when needed.
- In the year, 2016, two other projects; Radisson Blu Hotel - Exchange Complex and Exchange Complex Residential Blocks A & B both received Preliminary EDGE certifications. However, both projects are still under construction and yet to be completed and commissioned. In 2017 and early 2018 respectively, two other projects; and Consar Ltd New Head Office and GNPC Research and Technology Centre both in Accra also registered for LEED certifications and are awaiting certification. The latest certified green building in Ghana was commissioned in January, 2018.
- Located in the Komfo Anokye Teaching Hospital, Kumasi, is the new Mother and Baby Unit which received the EDGE hospital certificate to become the first EDGE certified 'green hospital' in Africa as well as the first certified green building in Kumasi away from Accra the national capital. The EDGE certificate confirms that the Mother and Baby Unit achieves 56% energy savings and 33% water savings when compared with a similar hospital. It also confirms that there is 42% less energy embodied in materials.

Institutional Arrangement

Dadzie et al., (2012) notes that the green building initiative is multifaceted and has a wide mix of stakeholders who play various roles. The stakeholders involved include; The Client Community – public and private sectors, the Design Community, the Supply Chain (Materials Suppliers, Machinery Manufacturers, and Sub-assemblers), Main Contractors and Sub- Contractors, Universities, technical institutions and Professional associations, Economic drivers such as Banks and other financial corporations, and Trade Unions, including regulation and standards authorities (Agbodjah, 2008; Osei, 2013). All these often play different roles to achieve a project in Ghana.

The activities of the stakeholders as stated are managed by the Ministry of Water Resources, Works and Housing (MWRWH) which is responsible for housing infrastructure, and the Ministry of Transportation (MoT) which regulates the roads and civil related infrastructure sector. MWRWH is responsible for the formulation and co-ordination of policies and programmes for the development of the country's infrastructure requirements and also monitors and evaluates the performance of public and private agencies with regard to the execution and attainment of these policy and programme objectives (Agbodjah, 2008).

**Specific technology[1] barriers** (up to one page):

This section should answer the questions "what are the technology barriers that hinder national efforts described above" and "how will the CTCN technical assistance complement these efforts?" Building upon the problem statement and taking into consideration the existing efforts described above, please describe the specific technology barriers encountered by the requesting applicant to identify, assess or deploy climate technology(ies) in an effort to address the problem statement. The described barriers should be within the scope of the requested CTCN technical assistance (described in the section below).

Technology Barriers:

- 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 Sstainable 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 has been largely limited to education and publication of the 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) identify the high costs of Green Building Technologies. Lack of demand for sustainable products and cultural change resistance as the major challenges to implementation of 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

[1] *"**any equipment, techniques, practical knowledge and skills** needed for reducing greenhouse gas emissions and adapting to climate change" (Special Report on Technology Transfer, IPCC, 2000)*

by clients and stakeholders of construction projects affecting its eventual supply. Williams and Dair (2006) in the same vain 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 GB in Ghana. Darko and Chan (2018) proposed important Demand for green building in Ghana strategies to promote GBTs adoption 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 as a result 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 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).

- Initial and operational cost of sustainable buildings are very high as compare 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

**Sectors:**

Please indicate the main sectors related to the request:

| | | | |
|---|---|---|---|
| ☐ Coastal zones | ☐ Early Warning and Environmental Assessment | ☒ Human Health | ☒ Infrastructure and Urban planning |
| ☐ Marine and Fisheries | ☒ Water | ☐ Agriculture | ☐ Carbon fixation |
| ☒ Energy Efficiency | ☐ Forestry | ☐ Industry | ☒ Renewable energy |
| ☐ Transport | ☒ Waste management | | |

Please add other relevant sectors:

**Cross-sectoral enablers and approaches:**

Please indicate the main cross-sectoral enablers and approaches

| | | | |
|---|---|---|---|
| ☒ Communication and awareness | ☐ Economics and financial decision-making | ☒ Governance and planning | ☐ Community based |
| ☐ Disaster risk reduction | ☐ Ecosystems and biodiversity | ☐ Gender | |

**Technical assistance requested** (up to one page):

Founded on the problem statement, past/on-going efforts and technology barriers, please describe the requested technical assistance. The technical assistance should clearly contribute to mitigation or adaptation to climate change as described in the problem statement and contribute to overcome the specific technology barriers.

Within a clearly defined scope, the description of technical assistance should be structured into the following:

- Overall objective
- Anticipated groups of activities to be performed by the technical assistance
- Anticipated products to be delivered by the technical assistance.

Please note that the CTCN facilitates technical assistance and is not a project financing mechanism.

Overall objective
To support the achievement of targets set by the Government of Ghana under various Conventions through development of the Green Building Standards for Ghana which 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. (Buildings to include public and urban and rural residential settlements).

EXPECTED ACTIVITIES

1. Technology performance review and evaluation across the building sector in the country.
2. Comprehensive technology needs assessment of various frameworks to reflect international green technology principles.
3. Development of Green Building Standards/Guidelines for Ghana to cater for building design and evaluation, construction, technology implementation, operation and maintenance.
4. Development of enforcement tool for effective implementation of the standard
5. Review and enhance existing Green Building Rating certification Tool if any to align to international standards
6. Development of policy guidelines for building greening standards based on type of building.
7. Support the updating of the existing building regulations to reflect the Green Building Standards
8. Organize technical training programme for relevant national stakeholders to discuss and provide recommendations on key indicators for green/climate-proofed buildings and technology solutions.

EXPECTED DELIVERABLES (following the structure of the activities)

1. Guidelines or procedure for green technology inclusion in the building sector.
2. Establishment of gaps in existing green technology frameworks of technological needs in the country
3. Green Building Guideline/Standards that meet international standards with design tools, guidelines, checklist, documentation process to be followed by practitioners in the industry.
4. Enforcement programme for green building standards/guidelines
5. Revised and improved rating tools for existing Green Building Rating certification Tool
6. Policy Guidelines for the new standards by building type
7. Updated building regulations to reflect the Green Building Standards
8. Technical Training Programme on green/climate proofed buildings and their related technologies

**Expected timeframe:**

Please indicate the expected duration period for the requested technical assistance. Please note CTCN technical assistance is limited to a maximum duration of 12 months.

12 Months

**Anticipated gender and other co-benefits from the technical assistance:**

Please describe the activities with gender linkages as well as the anticipated gender and other co-benefits (e.g. biodiversity, economic, social, cultural, etc.) that are likely to be generated as a result of the technical assistance.

For more information you can find guidelines on the CTCN's website here:
https://www.ctc-n.org/technologies/ctcn-gender-mainstreaming-tool-response-plan-development

Further reading on gender can be found on the CTCN website here:
https://www.ctc-n.org/technology-sectors/gender

The anticipated gender benefits will include

1. Capacity Building - Women and men will benefit equitably from technical assistance and related project training

2. Advocacy and Conscientizing - Active involvement of all professionals within the built environment, manufacturing industry, user groups in awareness campaigns in a gender responsive way.

3. Decision making - equal participation of women and men in decision making. - Equal access to resources related to the green building standards implementation and use.

4. 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.

5. 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.

**Key stakeholders:**

Please list the stakeholders who will be involved in the implementation of the requested CTCN technical assistance and describe their role during the implementation (for example, government agencies and ministries, academic institutions and universities, private sector, community organizations, civil society, etc.).

| Stakeholders | Role to support the implementation of the technical assistance |
|---|---|
| National Designated Entity/EPA | support implement and provide oversight of the TA activities and co-ordinate between CTCN and consultants |
| Ministry of Environment | Provide policy direction and guidance on the policy regarding the |

| | |
|---|---|
| Science Technology and Innovation | project. Will work with coordinating institution to ensure the participation of the subordinate organizations involved in the programme for successful implementation. |
| Ministry of Works and Housing | |
| Ministry of Energy | |
| Ministry of Trade | |
| Energy Commission | Lead government institution with stator responsibility for EE and RE in Ghana. EC will be supervising the operations for successful implementation of the whole programme. |
| Ghana Standards Authority | Ghana Standards Authority is responsible for developing, publishing and promoting standards in the country. They will support the project to provide advice and some standardisation on establishing green building guides and standards such as importation of building materials to meet specifications. |
| Ghana Institute of Architects | Promotes research, education and guidance on education training and research in the Art and Science of Architecture and its related disciplines in the Building Industry in Ghana |
| Ghana Green Building Council (GhGBC) | Ghana Green Building Councils is an independent, non-profit organisation accelerating the uptake of sustainable buildings. The Council drive environmental, economic and social impact within the built environment on a national, regional and global scale to establish a fully developed and operational with an impact on green building programmes and delivering change on a national level by embracing best practice in the building industry. |
| | |

Alignment with national priorities (up to 2000 characters including spaces):

Please describe how the technical assistance is consistent with national climate priorities such as: Nationally Determined Contribution, national development plans, poverty reduction plans, technology needs assessments, Low Emission Development Strategies, Nationally Appropriate Mitigation Actions, Technology Action Plans, National Adaptation Plans, sectorial strategies and plans, etc.

| **Reference document** (please include date of document) | **Extract** (please include chapter, page number, etc.). |
|---|---|
| Ghana Updated Nationally Determined Contribution under the Paris Agreement (2020 - 2030) | The NDCs are expected to drive Ghana's efforts to attain a low carbon climate resilience future. As we take steps to tackle climate change, we are 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.<br><br>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.<br>https://unfccc.int/sites/default/files/NDC/2022-06/Ghana%27s%20Updated%20Nationally%20Determined%20Contribution%20to%20the%20UNFCCC_2021.pdf |
| Ghana National Climate Change Policy (NCCP), Ministry of Environment Science, Technology and Innovation, 2013 | The NCCP 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<br>4.5 Energy, Industrial and Infrastructural Development<br>Focus Area 10: Minimize Greenhouse Gas Emissions Principles<br>The main principles are that:<br>J The development of infrastructure and associated facilities has a direct influence on the sustainable development of the nation.<br>J Incorporating climate-resilient codes into basic infrastructure will significantly reduce the vulnerability of the nation to climate change risks.<br><br>One Key Challenge is the Lack of design standards and codes for architects and engineers to design or rehabilitate structures to optimize emission reductions.<br>(Page 64, Chapter 4, section 4.5)<br>https://www.un-page.org/files/public/ghanaclimatechangepolicy.pdf |
| Ghana Shared Growth and Development Agenda I & II (2009/2014) | 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<br>J 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)<br><br>Pages 27 and 28<br>https://www.un-page.org/files/public/gsgda.pdf |
| National Housing Policy, MWRWH, 2015 | b) Sustainability and Resilience: Utilise sustainability principles to guide shelter and human settlement development:<br><br>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.<br><br>Page 11, Chapter 2.1 Guiding Principals<br>https://www.mwh.gov.gh/wp-content/uploads/2018/05/national_housing_policy_2015-1.pdf |

| | |
|---|---|
| Ghana's intended nationally determined contribution (INDC) and accompanying explanatory note, sept.2015 | The long-term goal of Ghana's adaptation is to increase climate resilience and decrease vulnerability for enhanced sustainable development. Adaptation under Ghana's INDC is informed by:<br>⁾good governance and inter-sectoral coordination,<br>⁾capacity-building, the role of science, technology and innovation,<br>⁾adequate finance from both domestic sources and international cooperation,<br>⁾promoting outreach by informing, communicating and educating the citizenry; and<br>⁾adhering to accountable monitoring and reporting<br>Page 7 of 16, Section 2.2 Adaptation Goal,<br>https://www.resourcedata.org/dataset/rgi21-ghanas-intended-nationally-determined-contribution-indc/resource/699786f5-bcd1-4655-845d-bca94e6a619c |
| National Energy Policy (2010) and National Energy Strategy (2010) | These policies aim to develop an energy economy that guarantees a reliable supply of high-quality energy services for all sectors of Ghana. The policy covers areas such as power; renewable energy; petroleum; waste-to-energy; energy and gender; energy efficiency and conservation; energy and environment; and managing the future of the energy sector<br><br>https://www.greengrowthknowledge.org/sites/default/files/downloads/policy-database/GHANA%29%20National%20Energy%20Policy.pdf |
| Ghana's intended nationally determined contribution (INDC) and accompanying explanatory note | 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 programme 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 are expected to help attain low carbon climate resilience through effective adaptation and greenhouse gas (GHG) emission reduction in the following priority sectors:<br>⁾Sustainable land use including food security<br>⁾Climate proof infrastructure<br>⁾Equitable social development<br>⁾Sustainable mass transportation<br>⁾Sustainable energy security<br>⁾Sustainable forest management; and<br>⁾Alternative urban waste management.<br><br>Page 2 of 16<br>https://www.resourcedata.org/dataset/rgi21-ghanas-intended-nationally-determined-contribution-indc/resource/699786f5-bcd1-4655-845d-bca94e6a619c |
| Ghana Building Codes (GhBC) GS 1207:2018 | Part 37: Green Building Requirements, Page 1270 |

| | |
|---|---|
| | https://ghis.org.gh/wp-content/uploads/2021/09/BUILDING-CODE-GS-1207_2018-Complete-Complementary-Copy.pdf |
| Ghana's Climate Change Technology Needs and Needs Assessment Report Under the United Nations Framework Convention On Climate Change, Version 1(January 2003) | Ghana's first TNA highlights the need for green Energy and Waste Technologies that are beneficial in sustainable Infrastructure development<br>Chapter 2 (2.1 Energy and 2.2 Waste)<br>http://www.un-gsp.org/sites/default/files/documents/ghana_tna.pdf |

**Development of the request** (up to 2000 characters including spaces):

Please describe how the request was developed at the national level and the process used by the NDE to approve the request before submitting it (who initiated the process, who were the stakeholders involved and what were their roles?) and describe any consultations or other meetings that took place to develop and select this request, etc.

**Background documents and other information relevant for the request:**

- Please list all relevant documents that will help the CTCN analyse the context of the request and national priorities. Please note that all documents listed/provided should be mentioned in this request in the relevant section(s), and that their linkages with the request should be clearly indicated. For each document, please provide web-links (if available) or attach to the submission form. Please add any other relevant information as required.
- Please indicate if this request has been developed with the support of the CTCN Request Incubator.

NDCs, Environment Policy, Technology needs assessment, Ghana's Low emissions development strategy, Energy policy, renewable energy policy, national communications report, Agenda 2020, building regulations etc

**OPTIONAL: Linkages to Green Climate Fund Readiness and Preparatory Support**

The CTCN is collaborating with the GCF in order to facilitate access to environmentally sound technologies that address climate change and its effects, including through the provision of readiness and preparatory support delivered directly to countries through their GCF NDA. These actions are in line with the guidance of the GCF Board (Decision B.14/02) and the UNFCCC, particularly paragraphs 4 and 7 of 14/CP.22 that addresses Linkages between the Technology and the Financial Mechanisms[2].

The CTCN is therefore implementing some of its technical assistance using GCF readiness funds accessed via the country's NDA. Any application for GCF support, including the amount of support provided, is subject to the terms and conditions of the GCF and should be developed in conjunction with the NDA.

[2] Please see: https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf

Please indicate whether this request has been identified as preliminarily eligible by the NDA to be considered for readiness support from the GCF.

☒ Initial engagement: The GCF NDA of the requesting country has been engaged in the design of this request and the NDA will be involved in the further process leading to an official agreement for accessing GCF readiness support.

☐ Advanced engagement (preferred): The GCF NDA of the requesting country has been directly involved in the design of this request and is a co-signer of this request, the signature indicating provisional agreement to use readiness national funds to support the implementation of the technical assistance.

NDA name:

Date:

Signature:

**Monitoring and impact of the assistance:**

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the technical assistance provided by the CTCN. I understand that these processes will be explicitly identified in the CTCN Response Plan and that they will be used in the country to monitor the implementation of the technical assistance following standard CTCN procedures.
I understand that, after the completion of the requested assistance, I shall support CTCN efforts to measure the success and effects of the support provided, including its short, medium and long-term impacts in the country.

**Signature:**

| | |
|---|---|
| NDE name: | Joseph Amankwa Baffoe |
| Date: | 23rd August 2022 |
| Signature: |  |

**THE COMPLETED FORM SHALL BE SENT TO THE CTCN@UNEP.ORG**

The CTCN is available to answer all questions and provide guidance on the application process.