Readiness and Preparatory Support Proposal

How to complete this document?

- A Readiness Guidebook is available to provide information on how to access funding under the GCF Readiness and Preparatory Support programme. It should be consulted to assist in the completion of this proposal template.
- This document should be completed by National Designated Authorities (NDAs) or focal points with support from their delivery partners where relevant.
- Please be concise. If you need to include any additional information, please attach it to the proposal.
- Information on the indicative list of activities eligible for readiness and preparatory support and the process for the submission, review and approval of this proposal can be found on pages 11-13 of the guidebook.
- For the final version submitted to GCF Secretariat, please delete all instructions indicated in italics in this template and provide information in regular text (not italics).

Where to get support?

- If you are not sure how to complete this document, or require support, please send an e-mail to countries@gcfund.org. We will aim to get back to you within 48 hours.
- You can also complete as much of this document as you can and then send it to countries@gcfund.org. We will get back to you within 5 working days to discuss your submission and the way forward.

Note: Environmental and Social Safeguards and Gender

Throughout this document, when answering questions and providing details, please make sure to pay special attention to environmental, social and gender issues, particularly to the situation of vulnerable populations, including women and men. Please be specific about proposed actions to address these issues. Consult page 7 of the readiness guidebook for more information.

SECTION 1: SUMMARY	
1. Country submitting the proposal	Country name: **The Bahamas** Name of institution representing National Designated Authority (NDA) or Focal Point: **Ministry of the Environment and Housing** Name of NDA/Focal Point: **Ms. Janice Miller** Position: **Permanent Secretary** Telephone: **(242) 322-6005/6** Email: janicemiller@bahamas.gov.bs / romauldferreira@bahamas.gov.bs Full office address: **Charlotte House, 2nd Floor North Wing, Charlotte & Shirley Streets, Nassau**
2. Date of initial submission	21/9/2017
3. Last date of resubmission	04/12/2017
4. Which entity will implement the Readiness and Preparatory Support project?	☐ National Designated Authority ☐ Accredited Entity ☒ Delivery Partner Name of institution: The **United Nations Industrial Development Organisation (UNIDO)** on behalf of **The Climate Technology Centre and Network (CTCN),** Name of official: **Jukka Uosukainen** Position: CTCN **Director** Name of official: **Katarina Barunica** Position: Associate **Industrial Development Expert** Telephone: **+43 1 26026 3803** Email: k.barunica@unido.org **Name of official: Federico Villatico Campbell** **Position: Climate Technology Manager** Telephone: **+45 45335375** Email: f.villatico@unido.org Full Office address: **United Nations Industrial Development Organization (UNIDO), Vienna International Centre (VIC), Vienna, Austria**
5. Title of the Readiness support proposal	**The Bahamas Power System Stability Study for Implementation of a Higher Renewable Energy Penetration Level**
6. Type of Readiness support sought	X Readiness o Establishing and strengthening national designated authorities or focal points X Strategic frameworks, including the preparation of country programmes o Support for accreditation and accredited direct access entities ☐ Adaptation Planning
7. Brief summary of the request	The Bahamas has a commitment to achieve at least 30% renewables in the energy mix by 2030, which will be met primarily by variable solar energy. In 2014, The Bahamas Electricity Act was amended to allow, for the first time, residential customers and small businesses to supply

	electricity to the national grid through the Residential Energy Self-Generation Program. As the regulatory framework for this program becomes more defined, it is anticipated that this program will account for approximately 10% of the 2030 goal. The Government of The Bahamas has also reached out to various partners to successfully execute the retrofitting of government owned buildings with renewable energy, mostly in the form of solar systems and energy efficient components. To date, the Office of the Prime Minister has been retrofitted with energy efficient electrical components and lights. Through bi-lateral relationships with other nations, we have secured grant funding for the installation of a 250kW solar system at one of the largest public high schools in the capital and a 900kW solar covered parking lot at the national stadium. Other initiatives include the continued retrofit of all government buildings with solar systems and/or energy efficient components, the introduction of solar systems at the international airport in New Providence and the University of The Bahamas. Additionally, as The Bahamas is an archipelago of small islands, many with even smaller populations, there are plans to introduce renewable energy systems to some 14 of the more sparsely populated islands to relieve some of the pressure on the national grid to supply power to these areas and also to increase the reliability of power to these areas. Along with these initiatives, the government has significantly reduced the tax on energy efficient and solar system and battery imports. This tax reduction to between 0 to 5% on the various components was designed to encourage consumers to import the more energy efficient components, as opposed to the traditional components at the higher tariff, around 45%. For continued reliability of the whole power supply of the country, it is critical that system operators understand the potential impacts of variable generation on their systems. This technical assistance will develop a comprehensive methodology for assessing the stability of the power grid and provide a customized solution to enhance the country's ability to accommodate 30% renewables. This project will identify a set of critical scenarios that are most challenging for the operation of the current Bahamas grid with 30% renewables. Under each critical scenario, the project team will conduct a comprehensive dynamic analysis to identify the potential stability issues and evaluate the consequences. The planned stability assessment will include studies on frequency response, transient stability, and voltage stability. This project will work with local stakeholders to provide a customized plan of recommended practices and technologies to improve The Bahamas grid's ability to accommodate significantly more clean energy. Through this work, system operators will achieve the capability to continue to advance national policy objectives while maintaining power reliability, security, and efficiency.
8. Total requested amount and currency	**$369,715 USD**
9. Anticipated duration	**18 months (from contract signature by the implementer)**

SECTION 2: LOGICAL FRAMEWORK

Please complete the table below by including proposed outcomes, baseline situations, the targets for implementation period, and the activities to be undertaken, including key outputs or deliverables. Please add rows for additional outcomes as needed. For further guidance on completing the table, please refer to the guidebook "Accessing the GCF Readiness and Preparatory Support Programme", including specific Outcomes to select from.

OUTCOMES	BASELINE	TARGET	ACTIVITIES *Please include at least one specific deliverable output for each activity, and the timeframe (month number) in which it will be delivered to GCF.*
4. Access to finance			
4.2 Country programmes, concept notes, including on adaptation, developed that implement high-impact priorities identified in INDCs and other national strategies or plans	*2017: None*	*2019: Dynamic models for grid stability of the 15 inhabited islands of The Bahamas, contemplating a 30% RE penetration*	The study is designed to answer questions that system operators and other stakeholders may have about The Bahamas power grids' security and stability under high penetrations of renewable generation. In fact the utility company continues to experience difficulties with respect to the reliable delivery of power, especially during peak hours of the summer months. The utility has also indicated a strong desire to diversify the energy matrix, considering the fluctuating cost of fuel, the decreasing cost of solar power and the country's climate change commitments. As the government owned utility and the largest provider of electricity in The Bahamas, the utility is committed to the expansion of renewable energy in The Bahamas. This study will assist in the effective development of a plan for the roll-out of renewable energy that will protect the stability of the national grid and also ensure the reliability of power delivery to Bahamians. The key stability issues and challenges of integrating renewable generators in The Bahamas power grids will be addressed through stability analysis using realistic grid power flow based on generators' dynamic models. Base case power system models and associated data for both state and dynamic models will be adapted for the 2030 cases and then transferred to the utility together with training to ensure capacity and expertise are built to continue to utilize the models in planning and operations to accommodate a sustainable growth of reliable RE sources. The main activities and expected outcome are as follows: **4.2.1. Activity 1 - Data collection and analysis** The Utility has been fully engaged in this process from inception to this point and will continue to be engaged as the number one stakeholder. They have agreed to share all data relevant to the execution of the activity. Throughout this activity, the utility staff will continue to be consulted to obtain current power models and associated data. Base case models will be set up and validated with system operator. Results will inform the assumed topology of renewable generation sources with the existing power grid. An adequate system model obtained from BPL based on robust data will be essential for the success of

this study. This activity will focus on critical data including:

- Power system steady state model:
  a) The existing power flow model of all fifteen of The Bahamas grids will provide the fundamental knowledge of system configuration and parameters.
  b) Any available production simulation model results of the Bahamas grids can be used to help define stressed system conditions.

- Power system dynamic model:
  a) The existing dynamic model of the Bahamas grid will provide key parameters for the dynamic study. For example, the parameters of the existing generators and their controllers, etc., will allow for setting a baseline of current grid health.
  b) Historical event data such as voltage and angle during and after an n-1 event can be used for simulation formulation.

Both inverter-based utility scale renewable power plants' and distributed renewable generators' models including the controllers will be used to study dynamic response and their stability impacts.

- Time-series load and renewables data, where available:
  a) Load profiles.
  b) Wind speed time-series profile for any future wind power plants.
  c) Solar irradiance/solar power time-series profile for both existing and hypothetical future solar power plants.

The statistical analysis of the load, wind and solar generation over multiple time frames will be used to quantify the grid variability before and after integration of the 2030 case with 30% renewables.

4.2.2. Activity 2 - Determine critical scenarios for stability study

The goal of this task is to determine critical scenarios for all of The Bahamas' power grids through a continuous interaction with BPL. A qualitative report to describe the system and its associated operational challenges will be developed. Further, the data itself, with the critical scenarios defined, will be delivered and owned by the utility.

A participative approach with all relevant stakeholders will be applied: with government agencies, private developers, distributed generation candidates, and utility staff will be convened as needed (depending on information availability) to provide feedback on likely geographical locations of future renewable energy plants for all systems. In parallel to this consultations, an expert will also conduct gender focused baseline studies for the RE sector.

Stressed system dispatch scenarios will be defined which are critical for stability studies. A meeting will be held to present the defined critical scenarios with the utility and pertinent stakeholders and allow for interaction with utility staff to enable capacity building for addressing operational challenges associated with a higher variable generation level. The utility staff will have the opportunity to engage with the critical scenarios in a "hands-on" fashion themselves to track the work being performed to evaluate the Bahamas systems. This will apply to all electrical system operators in the Bahamas – Bahamas Power and Light as well as any other system operators.

Deliverables:

Deliverable 2.1: Qualitative study (including data) of the system and its operational challenges. In addition, one section will cover the gender baseline study.	→ Month 7
Deliverable 2.2: Meetings minutes	→ Month 8 initial meeting, then reports will be delivered every time a new meeting with BPL/Ministry of Env. is held during the whole duration of the project.

4.2.3. Activity 3 - Dynamic model development

The goal of this task is to develop the dynamic models of the fifteen Bahamas grids which can properly represent 30% renewable energy penetration in 2030 using a commercially available power flow model in collaboration with BPL as primary local energy producer. This task will adopt dynamic modelling of hypothetical utility-scale and residential PV as well as any projected wind power plants. The software model selection will be undertaken by the selected implementer depending on his in-house capabilities and practises; however it will need to be compatible with BPL model in-use. Interaction with BPL during activity 1 will be instrumental for the software choice.

Subtask 3.1:

Develop a high renewable penetration model based on the investigation and work from **Activity 1 and 2**, which includes:

a) Modelling any existing renewable generators,
b) Modelling the hypothetical future renewable projects (wind, PV or energy storage) with or without advanced controllers for grid support, and
c) Modelling any planned transmission upgrades based on input from BPL.
d) Validation of the model simulation/results

The dynamic model (along with the dynamic stability analysis subject of the next activity) will represent key enabling environment products to understand the gaps/barriers to private sector investment in light of the expansion of the electric grid and the relating RE increase. The model will be in fact a tool that can be shared with and presented to potential private sector players willing to invest into the local power infrastructure. The participative approach already described will make sure that BPL and local stakeholders will be continuously involved in the model development by the implementer. This process will culminate in the final training module (month 18), during which the main findings and procedures will be collected and organised into training materials to be presented in a workshop.

Deliverables:

Deliverable 3.1: Dynamic Models of The Bahamas grids for the year 2030 (PSS/E or other software)	→ Month 10
Deliverable 3.2: An operations manual for the models including detailed descriptions	→ Month 11
Deliverable 3.3: Demonstration and training on the power flow models for the utility's future use, including M&E system. Deliverables include training materials, list of participants, and outcomes report	→ Month 18

4.2.4. Activity 4 - Dynamic stability analysis

Security and stability are the concrete foundation for the power systems operation. The power system is designed to handle variability of the load. Integration of more wind and solar will significantly change the pattern of variability in net load (load minus wind and solar) plus reduce the proportion of generation supplying grid inertia from rotating, synchronous machines. When a generation-loss contingency happens, the grid will require faster support, but there may be less generators with governor response controls to contribute to that support. Thus, the grid will be more vulnerable to stability issues. This is coupled with the fact that generator-loss contingencies may happen more

				frequently because the renewable generation is very sensitive to the weather. For example, a hurricane, thunderstorm or dense cloud layer can disable all or part of the generation on an island. This means the grid will be vulnerable even further. Based on the above concerns, it is important to understand and evaluate the island grids' dynamic performance with high renewable penetration. This task will conduct a comprehensive study of the multi-faceted dynamic and stability issues and will result in a risk evaluation of dynamic stability for the 2030 case. Further, this task will provide corresponding practical suggestions, and will provide BPL with the information and tools to enhance grid security and decrease the likelihood of island-wide grid blackouts, including indications on the most suitable energy storage solutions. Dynamic stability analysis includes: • **Frequency response study** It is particularly important that frequency be properly regulated in response to critical emergency events. In an island system, a relatively small disturbance from either generation or load can lead to large, and potentially unstable, deviations in grid frequency, due to the low inertial constant of the grid and limited number of synchronous generators providing primary frequency support. To address the potential issues, this subtask will develop and adopt different critical scenarios and model cases based on **Activity 3**. To study the systems' frequency response, the frequency metrics from the North American Electric Reliability Corporation (NERC) standard BAL-003 will be used as the evaluation index and the following typical tests will be simulated under this subtask: a) The largest loss of generation event (N-1 generator contingency) for light load case. b) The largest loss of generation event (N-1 generator contingency) for heavy load case. c) The largest loss of load event (N-1 load contingency). d) The renewable generation tripping event due to the extreme weather. e) Frequency support from a large PV plant inverter. • **Transient stability** In addition to maintaining the balance between generation and demand, power system operators must ensure that the grid can successfully transition from normal operation through a disturbance and into a new stable operating condition in the 10–20 seconds immediately following the disturbance. In this subtask, the power angle-based stability margin index and fault critical clearance time (CCT) will be used as the evaluation index and the following studies will be conducted for all fifteen grids under this subtask:

a) Sensitivity study of different composite load models, considering increased distributed resources and their integration.
b) Study of different fault conditions including generation loss, load loss, transmission line fault, low voltage ride through, etc.

- **Voltage stability**

In conventional power grids, synchronous machines can support grid voltage during a sudden voltage drop. Conversely, in a "weak grid," a large voltage fluctuation may happen as a result of a sudden disturbance. Voltage instability may increase in scenarios of high solar penetration because, at least current or 'legacy,' residential PV is incapable of providing reactive power support.

Short-circuit ratios (SCR's) will be calculated at different locations in the grids using the 2030 high renewables case to determine areas of power system weakness. The following analysis will be conducted under this subtask:

a) Quantify the relative grid strengths based on different scenarios.
b) Identify impacts of line outages, the loss of reactive power devices, etc.
c) Consider cloud coverage impacts on voltage stability.
d) Analyse potential mitigation to low grid strength.

Deliverables:

Deliverable 4.1: Technical report approved by the NDE and NDA on the comprehensive methodology for grid stability assessment of The Bahamas' including sections on Frequency Response, Transient Stability, and Voltage Stability detailing the various studies undertaken. The report will include clear calculations and recommendations regarding: - Necessary investments in the 15 grids required (and estimate of $) to guarantee stability at certain RE integration levels (e.g. 20% RE, 30% RE, etc.) - Necessary changes required in terms of technical standards and regulatory framework to facilitate the grid integration of RE and remove market barriers. - Summary for policy makers	→ Month 17
Deliverable 4.2: Recommendations of technological options for grid	

stability and RE integration. The deliverable will include an analysis of the most suitable energy storage solutions applicable to the specific case of the islands as well as a particular section with gender mainstreaming recommendations for the RE integration technological options; as well as for environmental, social and gender issues (ESS). CTCN gender mainstreaming tool will be used as baseline reference to assure that gender issues will be included since the early stage of the technology analysis of this proposal and throughout all the subsequent Outputs. A description of the gender tool can be found at this link: https://www.ctc-n.org/technologies/ctcn-gender-mainstreaming-tool-response-plan-development	→ Month 18

Activity 5 – Monitoring of the Readiness proposal

Activity 5 will contribute to UNIDO CTCN monitoring of this Readiness proposal during the implementation phase. It will also enable internal and external communication about the Readiness activities and achieved impact.

Deliverables:

Deliverable 5.1: Outcome and impact description - produce a one page description of intended outcomes and impacts	→ Month 1
Deliverable 5.2: Prepare a monitoring and evaluation plan	→ Month 1
Deliverable 5.3: Closure and Data Collection Report – produce a Readiness "Closure and Data Collection Report"	→ Month 18

SECTION 3: ADDITIONAL INFORMATION

This Readiness proposal builds upon the country NDC. The Bahamas committed to achieve a minimum of 30% renewables in the energy mix by 2030 that will allow for a 10% Residential Energy Self Generation Programme. However challenges in increasing the penetration of renewable energy (RE) systems still remain in terms of grid stability, entailing the upgrade of the electric grid, and a reliable electricity network with adequate distribution capacity and network infrastructure. Therefore this Readiness proposal is designed to enable the environment to transition the Bahamas electrical grid systems towards the 30% introduction of renewable energy by 2030. It lays the foundation upon which the country's electric grid can develop consistently and operate sustainably in the future.

This work will also contribute to removal of a major barrier to investments in the sector especially as far as private sector entities active in the renewable energy field are concerned, both nationally and internationally. In addition capacity to conduct grid stability assessment will be built in the Country: Power and Light (BPL) is the primary energy producer in Bahamas and also proponent of the request for technical assistance. Finally as a follow-up of this Readiness, a Concept Note can be envisaged in order to leverage bankable projects that can identify and operationalize the investments and technical, regulation and financial interventions required to grid infrastructure upgrade and at renewable energy level in order to reach the 30% penetration goal.

In particular, this GCF Readiness intervention will support and complement existing national, past and on-going processes, projects and initiatives implemented in the country to tackle the above mentioned difficulties:

- A feasibility of a Hybrid Solar and Wind Power System for an Island Community in The Bahamas study concluded that renewable energy in The Bahamas holds promise as an alternative for electricity production; however, the country is heavily reliant on fossil fuels for electricity. The study examined the benefits of solar and wind energy on a community scale on the island of New Providence in the Bahamas. The current system is grid connected and assumes a net billing policy because of the lack of a net metering policy and incentives in The Bahamas.
- Project of Identification and Implementation of Bahamas' Nationally Determined Contributions – Retrofitting of the Anatol Rodgers High School. The aim of this Readiness proposal is to increase The Bahamas NDC ambition through the five-year cycle by identifying and clarifying effective pathways to reach its goal.
- On the basis that funding becomes available and that the national grid is sufficiently able to withstand the change, plans are being developed to replace some 17MW of fossil fuel generated power with that of renewable energy across the Family Islands in The Bahamas. These projects are all in line with the national priorities and will have a positive lasting effect well past the implementation dates.
- This GCF Readiness will also complement the first Readiness proposal approved with CCCCC and will work closely with the NDA to ensure that the intervention is in line and transparent to the work of the NDA and The Bahamas' Country Programme. This assistance will not duplicate the already ongoing work but will both compliment, acknowledge and share resources whenever is possible and deemed practical. It is important to note that the key outcome of the project is to develop a comprehensive methodology for assessing the stability of the power grid and provide a customized solution to enhance the country's ability to accommodate a higher penetration of renewables that will feed into The Bahamas' Country Programme as potential GCF Projects.

In addition, it will be ensured that the assistance and its benefits are accessible for both men and women and any other vulnerable group. Special efforts will be made to involve mixed gender groups in all relevant activities of the technical assistance e.g. capacity building, trainings, consultations, etc. and special attention to environmental, social and gender issues will be paid. A CTCN gender mainstreaming tool will be used as baseline reference to assure that gender issues will be included since the early stage of the technology prioritisation of this proposal and throughout all the subsequent outputs. A description of the gender tool can be found at this link: https://www.ctc-n.org/technologies/ctcn-gender-mainstreaming-tool-response-plan-development

The proposed stability studies will consider the addition of renewable energy to all fifteen island grids. Using a scientific approach will build capacity to Bahamas Power and Light in the best practices for accommodating clean energy goals while reducing the country's dependence on imported fuels. The models themselves will be transferred to the utility together with training to ensure that capacity and expertise are built to continue to utilize the models in planning and operations to accommodate a sustainable growth of reliable RE sources; and ensure that the capacity will remain within The Bahamas. The country's technological training and capacity will be improved both at the level of academia and of the national/local governments as well as the private sector. It is anticipated that the data will be used as a baseline for infrastructure construction and also tourism management. In order to guarantee the uptake of the research findings of this technical assistance, a GCF Concept Note will be developed as a follow-up action to inform the Bahamas GCF portfolio.

SECTION 4: BUDGET, PROCUREMENT, IMPLEMENTATION AND DISBURSEMENT

4.1. Budget Plan

Please provide a breakdown of cost estimates and implementation schedule analysed according to the activities suggested in Section 2. Please feel free to replicate this table on Excel spreadsheet if needed.

OUTCOMES (same as in section 2)	**ACTIVITIES** (same as in section 2. Include at least one specific deliverable output for each activity, and the month number in which it will be delivered to GCF)	**TOTAL COST** (per activity)	**COST CATEGORIES**				**EXPENDITURE AND IMPLEMENTATION SCHEDULE** (add columns if >24 months)			
			Consultants[1]	**Travel**	**Workshops/ Trainings**	**Others**	**6m**	**12m**	**18m**	**24m**
4. Access to finance 4.2 Country programmes, concept notes, including on adaptation, developed that implement high-impact priorities identified in INDCs and other national strategies or plans	**Activity 1- Data collection and analysis**	**$59,375**	47,375 .- 1 Senior - Engineer (10 hrs) -3 Research Engineers[2] (1 int, 2 local) 145 hrs ~6 w/d per engineer - 2 senior analyst (1 local, 1 int), 60 hrs	5,500 .- 2 trips for 1 senior analyst for stakeholder meetings in The Bahamas. The exact location and related details are to be decided by the awarded organization but each trip should expect up to 4 small bilateral stakeholder	5,000 -For costs associated with workshops; including space and venue, publication development, material development etc	1,500 Refreshments, catering and other logistical considerations. (Local transportation will be covered by the consultants/eng).	59,375			

[1] It is a requirement in the CTCN bid to have a balanced team with both national and international consultants as part of the team; Details on whether the consultants are national or international can be found in the attached excel sheet

[2] Each engineer will take on different portions of the study development. Hours are estimated at 145 combined for 3 research engineers. This can be adapted/tailored according to the specific organization performing the work.

				meetings and/or 1 workshop, for a total of up to 8 stakeholder meetings and 2 workshops over the course of 2 5- day trips to the Bahamas; the workshop will last 1 or 1.5 days each with an estimated participation of ~60-80 key stakeholders. (travels of activity 1 and 2 might be combined or jointly undertaken on a case-by case basis according to the local counterparts availabilty and schedule)						
	Activity 2- Determine critical scenarios for dynamic study	**$65,400**	51,400 .- 1 Senior Engineer (int), 15 hours - 3 Research Engineers (1 int, 2 local or all 3 locals), 270 hours in total ~10 w/d per engineer - 1 Analyst (local), 40 hours	11,000 .- 2 trips for 1 senior engineer to present production cost results - 1 trip for 2 engineers to train BPL on the developed models	1,500 -For costs associated with workshops; including publication development, material development etc. The venue for the training to BPL, its logistic arrangements and projector to be provided in kind by the Utility or the Ministry of	1,500 Refreshments, catering and other logistical considerations. (Local transportation will be covered by consultants/eng).	65,400			

					Environment and the Housing.					
	Activity 3- Dynamic model development	**$59,150**	59,150 - 1 Senior Engineer (int), 30 hours - 3 Research Engineers (1 int, 2 local or all 3 locals), 360 hours in total ~15 w/d per engineer				19,715	39,435		
	Activity 4- Dynamic stability analysis	**$110,125**	110,125 .- 1 Senior Engineer, 40 hours - 3 Research Engineers, 700 hours (total) ~29 w/d per engineer					60,000	50,125	
	Activity 5- Monitoring of the Readiness proposal	**$7,500**	.- 1 senior analyst (local), 20 hours						7,500	
Sub-total for all activities		**$301,550**	275,550	**16,500**	**6,500**	**3,000**				
CONTINGENCY (UP TO 5% OF TOTAL ACTIVITIES)		$15,077					5026	5026	5025	
Project Management Cost (6%)	Executing Agency PMC[3]	14,333					5,000	5,000	4,333	
	Audit (x2)	8,000						4,000	4,000	
	Sub-total	**22,333**								
DELIVERY PARTNER FEE (UP TO 10% OF TOTAL ACTIVITIES)		$30,555					30,555			

[3] Executing Agency PMC is allocated for the following: 60% Project Manager, 20% Administrative Assistant, 20% site visit

TOTAL	$369,516								

4.2. Procurement Plan[4]

For goods, services, and consultancies to be procured, please list the items, descriptions in relation to the activities in section 2, estimated cost, procurement method, relevant threshold, and the estimated dates. Please include the procurement plan for at least the first tranche of disbursement requested below. Also, please feel free to replicate this table on Excel spreadsheet if needed.

ITEM	ITEM DESCRIPTION	ESTIMATED COST (US $)	PROCUREMENT METHOD	THRESHOLDS *(Min-Max monetary value for which indicated procurement method must be used)*	ESTIMATED START DATE	PROJECTED CONTRACTING DATE
A. Goods and Non-Consulting Services						
N/A						
SUB-TOTAL (US $)		**0**				
B. Consultancy Services						
Contract of Services to implement the TA	Technical assistance **"The Bahamas Power System Stability Study for Implementation of a Higher Renewable Energy Penetration Level"**	$343,160 USD	Competitive Process * to CTCN Network Members	$343,160 USD	Week 1	Week 7
SUB-TOTAL (US $)		**$343,160 USD**				
TOTAL COST (US $)		**$343,160 USD**				

*The selection of the institution from the Network of CTCN for the execution of the technical assistance is conducted through a competitive procurement process as per UNIDO Rules and Regulations, in line with CTCN procedures and with UN Rules and Regulations (being UNIDO the co-host of the CTCN, and a specialized agency established under the UN Charter). The CTCN nurtures a Network of more than 300 expert organizations in the field of low-carbon and climate resilient technologies. The required expertise to carry out the activities that define this intervention will be sourced from the Network. For this, the following four principles shall be given due consideration when undertaking the procurement functions of UNIDO:

i. Best value for money principle;
ii. Fairness, accountability, integrity and transparency of the procurement process;
iii. Effective competition;
iv. The best interest of UNIDO (as co-host, and on behalf of, the CTCN).

Please also refer to the Procurement Plan explanation below: Section 4.4; as well as Section 5 under the “CTCN processes before the selection of the implementer” for more information on CTCN’s Procurement Method.

4.3. Disbursement schedule

UNIDO will manage the disbursement request and schedule guided by the appropriate agreement and in line with its rules and regulations.

4.4. Additional information

Procurement Plan:

Overall financial management and procurement of goods and services under this readiness and preparatory support proposal will be guided by UN regulations, rules, policies and procedures.

UNIDO will be responsible for the implementation of the readiness activities and for procurement and contractual services, as well as reporting on the progress of this implementation in close coordination and strategic guidance from the NDA/FP. The procurement actions and the operational services will be carried forward in accordance with UN policies and procurement guidelines.

The specific procedures for procurement through the CTCN are as follows:
For a request that is eligible and prioritized, the Climate Technology Managers in charge of the respective request sources the appropriate expertise to develop the Terms of Reference of the assistance (called 'Response Plan' as per CTCN procedures). The response plan provides specific information on the technical assistance to be delivered, including activities, outputs, expected outcomes and impacts, timeline, indicators or measuring assistance progress and success, stakeholders to be involved, etc.

The response plan, once finalized, is signed by the national focal point of the CTCN in the concerned country (National Designated Entity), the institution which originated the CTCN request for technical assistance and the CTCN Director, and constitutes the basis of the assistance to be implemented and monitored upon the approval and in cooperation with the NDA. Based on the needs and expertise required in the response plan, a CTCN Network Member will be selected to implement it. The selection of organizations from the Network is conducted through a competitive procurement process as per UN Rules and Regulations, in line with CTCN and UNIDO procedures. The CTCN nurtures a Network of some400 expert organizations in the field of low-carbon and climate resilient technologies. The required expertise to carry out the activities that define this intervention will be sourced from the Network. For this, the following four principles shall be given due consideration when undertaking the procurement functions:

i. Best value for money principle;
ii. Fairness, accountability, integrity and transparency of the procurement process;
iii. Effective competition;
iv. The best interest of the CTCN.

SECTION 5: IMPLEMENTATION ARRANGEMENTS AND OTHER INFORMATION

5.1. Please attach an "implementation map" or describe how funds will be managed by the NDA/FP or delivery partner

UNIDO will manage the funds for the activities under this readiness agreement[5]. UNIDO will agree on a plan with the NDA of Bahamas to monitor the implementation of the activities using the grant proceeds. However, UNIDO will be responsible for the implementation of the activities under this readiness and preparatory support proposal.

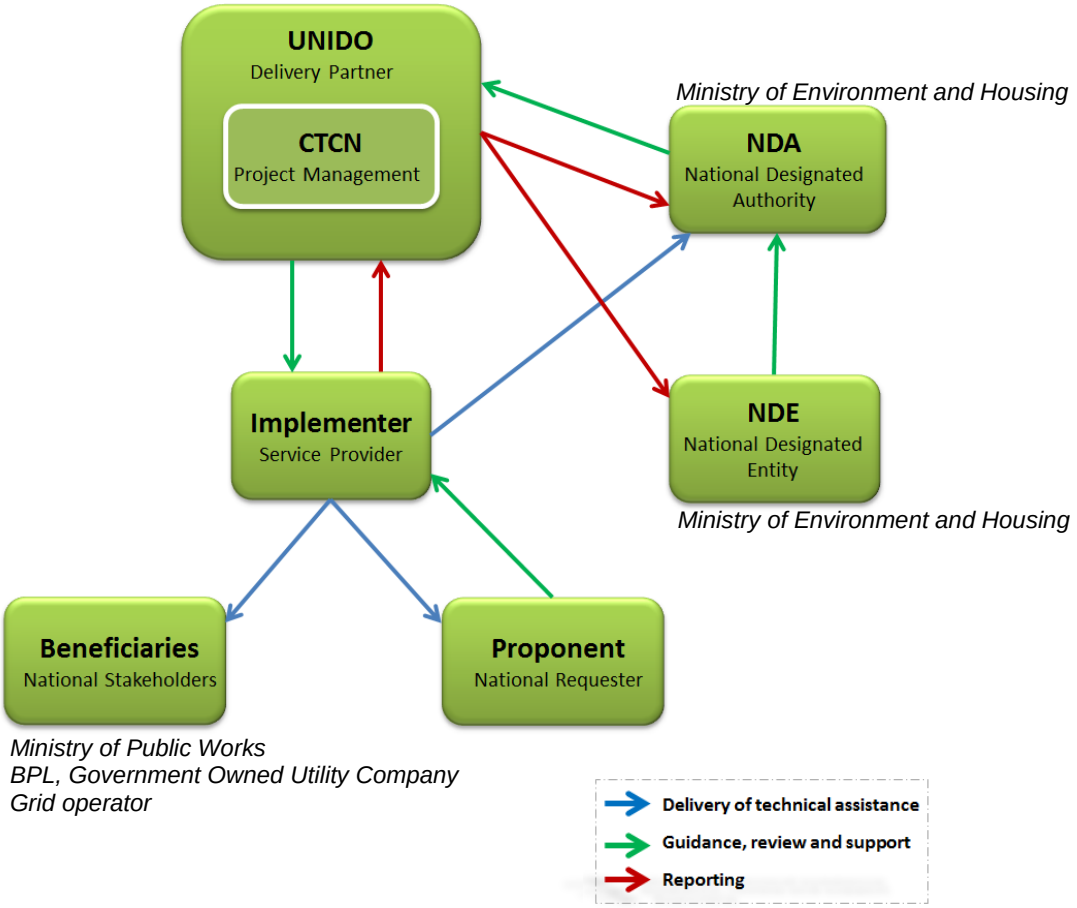
The CTCN Director will be the ultimate official responsible for the activities undertaken. According to CTCN process, the Climate Technology Manager assigned by the CTCN Director will provide the day-to-day management of the assistance provided, and will ensure that the project is progressing as per the planned activity and budget.

The selected entity from the Network will report to CTCN as per their contractual arrangement and in line with UN rules and regulations. They will produce regular progress and financial reports and will submit deliverables to CTCN. Funds will only be released if and when the deliverables are satisfactory and cleared by CTCN. They will return any unspent funds within ninety days of expiry or notice of termination of the CTCN.

The UNFCCC country focal points for technology (NDE) and finance (NDA) will provide active support to the implementer in the execution of this technical assistance. Their roles as country focal points will include, but not be limited to: Ensuring the activities associated with the implementation of this technical assistance are aligned with national climate priorities; promote and engage with key stakeholders as identified by the implementer; promote and present this technical assistance in climate change-related events; and participate in CTCN events and in national workshops affiliated with this technical assistance, if required. They will also be expected to provide guidance and review any relevant documents produced, and will be kept apprised of the progress of the technical assistance. The implementation map below summarizes the different interactions between the different parties involved in this technical assistance:

[5] *UNIDO is fully accredited by the GEF. UNIDO came into full compliance with the GEF fiduciary standards in October 2013 and, since then, with the GEF Environmental and Social Safeguards and Gender policies in May 2015. Please see GEF council documents, confirming UNIDO's compliance with relevant GEF policies and standards, under the following links:*

- *GEF/C.48/06 - GEF AGENCY COMPLIANCE WITH POLICIES ON ENVIRONMENTAL AND SOCIAL SAFEGUARDS, GENDER, AND FIDUCIARY STANDARDS-May 07, 2015: https://www.thegef.org/sites/default/files/council-meeting-documents/EN_GEF.C.48.06_Agency_Compliance_with_Safeguards_May%207.pdf*
- *GEF/C.45/Inf.04 - AGENCY PROGRESS ON MEETING THE GEF FIDUCIARY STANDARDS - October 9, 2013: https://www.thegef.org/sites/default/files/council-meeting-documents/rev.GEF_.C.45.Inf_.04_Agency_Progress_on_Meeting_the_GEF_Fiduciary_Standars_October_9_2013_Final_0_4.pdf*
- *GEF/C.46/Inf.05 - AGENCY PROGRESS ON MEETING THE GEF FIDUCIARY STANDARDS - April 25, 2014: https://www.thegef.org/sites/default/files/council-meeting-documents/GEF.C.46.Inf_.05%20Agency%20Progress%20on%20Meeting%20the%20GEF%20Fiduciary%20Standards_April%2022%202014.pdf*



CTCN processes before the selection of the implementer (described in the implementation map)

The CTCN process for managing technical assistance is the following: Requests for technical assistance can be prepared by any applicant organization from a developing country, but all requests must be submitted by the CTCN NDE (national focal point in the concerned country). Once submitted, all requests submitted by developing countries are assessed as per eligibility, balancing and prioritization criteria approved by the CTCN Advisory Board. The three eligibility criteria are the following: 1) The support provided will contribute to increased resilience and/or mitigate emissions, and is aligned with national plans; 2)The support will enhance endogenous capacities; and; 3) Processes are in place in the requesting country to monitor and evaluate any support provided (that is, project accountability is ensured). Balancing criteria are looking at inter and intra-regional an geographical balance (with a preference for requests submitted by LDCs and other highly vulnerable and low capacity countries; balance between adaptation and mitigation objectives, and balance between various types of support spanning the technology cycle. Prioritization criteria consider a number of elements that demonstrate project strengthen and potential for success, including the promotion of endogenous capacities and appropriate technologies, potential for scale up, for South-South cooperation, for leveraging public and private financing, for creating social, economic and social benefits, promoting gender equality etc.

Once a request is deemed eligible and prioritised, the CTCN selects the best expertise among its consortium partners to develop a response plan. The criteria for selection are: Relevant technical expertise, Experience and network in national context, Relevant language capacity, Response Planning track record, Representative use of the consortium partners in Response Planning and Feedback/ preference from the NDE.

Based on the discussion with the NDE, NDA and request proponent and feedback from the CTCN, the consortium partner develops the response plan. Once an advanced version is prepared, it is presented to CTCN's director NDE and NDA for signature. Once the response plan is signed, the contracting of the implementer starts.

5.2. Other relevant information

Contingency plan:
Below can be found potential risks that might prevent the project objectives from being achieved and the proposed measures that address these risks at the time of project implementation:

Risk	Rating	Mitigation
Involvement Risk: Lack of interest by the public and private sector key stakeholders, resulting in limited interest of local players to scale up the results of this intervention	*Low*	During project implementation a thorough consultative and participatory approach will be applied; form the very beginning the ownership of the technical studies will lie with the Ministry of Environment, the Ministry of Public Works and Utilities and the Utility of The Bahamas, as well as with the local key stakeholders;
Technical/Capacity risks: Lack of capacity by the national counterparts to use or implement the results and conclusions of this technical assistance	*Low*	The project is in line with national policies and the project will be executed in close coordination with the respective Ministry and authorities;
Management Risk: Lack of effective coordination between various project partners	*Low*	A proper coordination will be sought through the CTCN.
Ownership of the results: True ownership by the government and system operator to ensure results are used and up scaled accordingly	*Medium*	The ownership of the project has been secured by the Government given that it falls under their Work Plan. The results of this intervention set the foundation for them to be able to implement the Ministry of Housing and Environment Work Plan, being also the proponent of this request for TA to the CTCN. In addition, throughout the preparation of this proposal, there have been General Elections and a consequent change in the Government, however this situation did not pose any challenge to this proposal.
Climate Change Risk: Negative impacts of climate change and extreme weather events	*medium*	The potential impact of extreme weather events on the grids will be incorporated into the stability analysis.
Access to data: Data accessibility, mainly from the Utility and other involved stakeholders	*Medium*	Communication channels and information sharing with the Utility has been secured and their ownership clarified. Same for the other stakeholders.
Gender Risk: Resistance against or lack of interest in, the project activities from stakeholders, especially with regard to the active promotion of gender equality. Low participation rates of suitable female candidates due to lack of interest, inadequate project activity or missing qualified female population within the i.e. engineering sector.	*Low*	This Project will pursue thorough and gender responsive integration and ensure stakeholder involvement at all levels, with special regard to involving women and men.

Timeline:

Activity	Month																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Data collection and analysis																		
2. Determine critical scenarios for stability study																		

D2.1 Qualitative report and model data delivery	
D2.2 Minutes of the meeting presenting critical scenarios	
3. Dynamic model development	
D3.1 Dynamic Models of The Bahamas grids for the year 2030 (PSS/E or other software)	
D3.2 An operations manual for the models including detailed descriptions	
D3.3 Report on the training (incl. list of participants, training materials, outcome report)	
4. Dynamic stability analysis	
D4.1 Technical report on the comprehensive stability study	
D4.2 Plan of recommended practices & technologies	
5. Monitoring of the Readiness Proposal	
D5.1 Outcome and impact description	
D5.2 Monitoring and Evaluation Plan	
D5.3 Closure and Data Collection Report	

Budget explanation

The "Consultants" cost category in the budget refers to both international and local personnel to be hired for the execution of the work (for more details please refer to the attached budget in the Excel Sheet).

CTCN will be selecting the executing agency through a competitive tender process, evaluating complete technical and financial offers for the execution of the technical assistance. Due to the tendering process, the total budget might be different compared to the one approved by the GCF, being the latter the upper limit.

Within CTCN technical assistance a minimum amount of 1% of total budget is dedicated to gender mainstreaming, assuring that the gender topic is properly embedded into the technical analysis.