REQUEST FOR QUOTATION

INSTRUCTIONS TO USERS OF THIS DOCUMENT

1. This document is UNDP's standard Request for Quotation (RFQ) to be used when UNDP solicits Quotations for the procurement of a broad range of goods and standardized services.

2. The RFQ method may be used for any procurement of goods or standardized services below US $150,000, unless the UNDP Business Unit prefers to use other methods (Invitation to Bid or Request for Proposal) for requirements of lower values, based on justifiable circumstances.

3. Only UNDP staff who are familiar with UNDP's procurement principles, policies and procedures, specifically Procurement staff, must finalize this RFQ. In the unlikely event that a non-procurement staff will be tasked to finalize this RFQ, he/she must be guided by a Procurement staff knowledgeable on the UNDP procurement principles, policies and procedures.

4. This RFQ consists of four (4) parts, namely : (a) The letter of invitation; (b) the Technical Specification which should list the details of the requirements; (c) The Form for Submitting Quotation which is the template that suppliers must follow in submitting their quotes; and (d) The UNDP General Terms and Conditions attached hereto as Annex 3. These contents of the RFQ allow the users to reflect conditions specific to the country/Business Unit, the requirements of the requisitioner, and the nature of the goods needed.

5. UNDP staff preparing this RFQ must fill up the spaces and table cells provided with the necessary and correct information, indicating "N/A" or deleting the row from the table, if not applicable to the requirements. Where there are choices listed, the appropriate choice must be checked/ticked, and the non-applicable options deleted from the list. Additional information may be provided on each table cell, or through additional table rows, as and when the circumstances and the nature of the goods and logistical arrangement requires.

6. It is important that the General Terms and Conditions (GTC, Annex 3) <u>be attached at all times</u> to any and all RFQs to be released by UNDP, and the GTC must be in the .pdf format only.

7. Other instructions pertaining to specific pages and sections of the RFQ have been indicated as footnotes. UNDP staff who will be tasked to finalize this RFQ are requested to pay close attention to them and be guided accordingly.

8. Liquidated Damages (LD) clause refers to the amount which the Contractor must pay UNDP for the damages caused to UNDP resulting from the Contractor's breach of its obligations as per Contract. It is commonly used in the procurement of high-valued goods, but where delays and deviations will cause serious consequences to UNDP, they may also be applied to low-valued goods, if the nature and context of the requirement justifies. The application of LD is optional, as there may be procurement cases where reasonable delays do not pose serious risks.

   The purpose of LD is to avoid lengthy discussions and disputes over the amount of actual damages once the aggrieved party (e.g., UNDP) can prove breach of contract.

   When imposing LD, the amount must be determined based on good faith, and not as a means to penalize the contractor. The most logical basis therefore is an estimate of the actual damages that will ensue from the breach of the Contract. However, in many cases, that could not be determined. Hence, the best practice has so far been the combined application of the following:

   (a) the use of fixed percentage of the contract value, applicable on the unit of time (e.g., per day or per week) of delay;
   (b) the setting of a reasonable maximum limit of such damages (e.g., up to 10% of the contract value, or up to 60 days of delay); and
   (c) the consequence of exceeding the limit (e.g., termination of contract, cancellation of PO, etc.)

   An example of LD clause therefore would be : *"0.5% of contract for every day of delay, up to a maximum duration of 1 calendar month. Thereafter, the contract may be terminated".*

9. For any questions regarding the use of this RFQ, Procurement Officers may send an email to pso.info@undp.org

IMPORTANT : This first page of the document is intended for UNDP staff only. UNDP staff preparing the final RFQ must ensure that this page is <u>not</u> included in the RFQ that will be transmitted to Prospective Offerors.

Section 1: REQUEST FOR QUOTATION (RFQ)

(Goods and Services)

UNDP Haiti Country Office Solar PV System	DATE: 13th October 2022
	REFERENCE:

Dear Sir / Madam:

We kindly request you to submit your quotation for provision of Solar Hybrid System for the Haiti UNDP Country Office, as detailed in Annex 1 of this RFQ. When preparing your quotation, please be guided by the form attached here to as Annex 2.

Please take note of the following important deadlines (based on/by COB, EST time):

- Confirmation of participation in Main Site Visit and Bidders Conference: **28th October 2022**
- Main Site Visit: **Friday, 4th November 2022 - at 2 pm local time**
- Bidders' Conference: **Friday, 11th November – at 3 pm local time**
- Request for Clarification : **Friday, 18th November 2022, at 2pm local time**
- Offer Submission : **Friday, 25th November 2022**

Quotations may be submitted on or before 25th November 2022 and via (choose appropriate box) ☒*e-mail,* ☐*courier mail or* ☐*facsimile* to the address below:

United Nations Development Programme
[#14, Rue Reimbold, Bourdon, Port-au-Prince, Haiti
[procurement.ht@undp.org]

Quotations submitted by email must be limited to a maximum of **5 MB**, virus-free and should indicate the number "**22.263"** in the email subject. They must be free from any form of virus or corrupted contents, or the quotations shall be rejected.

It shall remain your responsibility to ensure that your quotation will reach the address above on or before the deadline. Quotations that are received by UNDP after the deadline indicated above, for whatever

reason, shall not be considered for evaluation. If you are submitting your quotation by email, kindly ensure that they are signed and in the .pdf format, and free from any virus or corrupted files.

Please take note of the following requirements and conditions pertaining to the supply of the above mentioned good/s: *[check the condition that applies to this RFQ, delete the entire row if condition is not applicable to the goods being procured]*

Delivery Terms [INCOTERMS 2010] *(Pls. link this to price schedule)*	☐FCA ☐CPT ☐CIP ☐DAP ☒ DPU
Customs clearance[1], if needed, shall be done by:	☐ UNDP ☒ Supplier/Offeror ☐Freight Forwarder
Exact Address/es of Delivery Location/s (identify all, if multiple)	United Nations Development Programme Country: Haiti City: Port-au-Prince Address: #14, Rue Reimbold, Bourdon, Port-au-Prince, Haiti GPS Coordinates: 18.5373585, -72.3071942
UNDP Preferred Freight Forwarder, if any[2]	Click here to enter text.
Distribution of shipping documents *(if using freight forwarder)*	Click here to enter text.

[1] *Must be linked to INCO Terms chosen.*
[2]*Depends on INCO Terms. The suggestion to use a UNDP preferred courier is only for purposes of familiarity with procedures and documentary requirements applicable to the UNDP when clearing with customs.*

Latest Expected Delivery Date and Time *(if delivery time exceeds this, quote may be rejected by UNDP)*	☒ 150 days from the issuance of the Purchase Order (PO) ☐ As per Delivery Schedule attached *[if delivery will be staggered]* Time: 12 00 hrs Time Zone of Reference: EST	
Delivery Schedule	☒Required ☐Not Required	
Mode of Transport	☐ AIR	☒LAND
	☒SEA	☐OTHER *[pls. specify]*
Preferred Currency of Quotation[3]	Local Currency: Haitian Gourde (HTG) *NB: Payable in HTG with the United Nations rate if submitted in United States Dollars (USD), according to the prevailing rate at the time of payment.*	
Value Added Tax on Price Quotation[4]	☐ Must be inclusive of VAT and other applicable indirect taxes ☐ Must be exclusive of VAT and other applicable indirect taxes	
After-sales services required	Please refer to the TORs	
Deadline for the Submission of Quotation	25th November, 2022 at 16.30 hrs *EST*	
All documentations, including catalogs, instructions and operating manuals, shall be in this language	☒ English ☐ French ☐ Spanish ☐ Others *[pls. specify, including dialects, if needed]*	
Documents to be submitted[5]	Bidders shall include the following documents in their quotation: ☒ Annex 2: Quotation Submission Form duly completed and signed	

[3] *Local vendors must comply with any applicable laws regarding doing business in other currencies. Conversion of currency into the UNDP preferred currency, if the offer is quoted differently from what is required, shall be based only on UN Operational Exchange Rate prevailing at the time of UNDP's issuance of Purchase Order.*
[4] *This must be reconciled with the INCO Terms required by the RFQ. Furthermore, VAT exemption status varies from one country to another. Pls. tick whatever is applicable to the UNDP CO/BU requiring the goods.*
[5] *First 2 items in this list are mandatory for the supply of imported goods*

	☒ Annex 3: General terms and conditions duly completed and signed and in accordance with the Schedule of Requirements in Annex 1. A statement whether any import or export licenses are required in respect of the goods to be purchased including any restrictions on the country of origin, use/dual use nature of goods or services, including and disposition to end users; Confirmation that licenses of this nature have been obtained in the past and an expectation of obtaining all the necessary licenses should the quotation be selected; Quality Certificates (ISO, etc.); ☒ Company Profile; ☒ Latest Business Registration Certificate; ☒ Completed and signed CVs for the proposed key Personnel; ☒ List and value of projects performed for the last 3 years plus client's contact details who may be contacted for further information on those contracts; ☒ List and value of ongoing Projects with UNDP and other national/multi-national organization with contact details of clients and current completion ratio of each ongoing project; ☐ Latest Internal Revenue Certificate / Tax Clearance; ☐ Complete documentation, information and declaration of any goods classified or may be classified as "Dangerous Goods". ☐ Written Self-Declaration of not being included in the UN Security Council 1267/1989 list, UN Procurement Division List or other UN Ineligibility List; In addition, bidders are required to provide the following as part of the TECHNICAL OFFER, presenting 9 separate attachments: a. Technical description of offer, including comprehensive description and diagrammatical representation of the technical solution offered. b. Datasheets and certificates of the required standards of the main components. c. Bill of Materials (BoM). d. Bidder's Statement Regarding Deviations/Non-Compliance (as per template provided in Appendix I in the ToR). h. Topics and content to be covered during training. i. Plan for bi-annual maintenance by the local partner, lasting for 3 years. Include the comprehensive details for procedures to be carried out during periodic inspection. j. Details on freight, logistics and installation plan in terms of timelines, delivery time and production time. k. Proposed work plan and approach criteria in relation to the requirements in the terms of reference (TORs). l. Risk assessment and Mitigation plan.

	In case the bidder is not a company registered and based in Haiti, and a local partner is required as per section 3.1 of the TOR, the following documents shall be included: a. Letter signed by both parties confirming relationship between the supplier and local service provider. b. Official documentation stating that the Local Partner is a registered business in the country. c. A detailed profile of the local service provider including documentary evidence of similar services performed by the company. FINANCIAL OFFER. a. Price and Delivery Schedule Form: Fully completed and duly authorized (see Annex 2) Please note all costs should be specified as indicated in the Price and Delivery Schedule Form. Therefore, the price of an item must not be included into another item.
Period of Validity of Quotes starting the Submission Date	☐ 60 days ☐ 90 days ☒ 120 days In exceptional circumstances, UNDP may request the Vendor to extend the validity of the Quotation beyond what has been initially indicated in this RFQ. The Proposal shall then confirm the extension in writing, without any modification whatsoever on the Quotation.
Partial Quotes	☒ Not permitted ☐ Permitted [*pls. provide conditions for partial quotes, and ensure that requirements are properly listed to allow partial quotes (e.g., in lots, etc.)]*
Payment Terms[6]	Total Acquisition ☒ 20% upon complete delivery of goods.

[6] *UNDP preference is not to pay advanced amount upon signing of contract. If vendor strictly requires advanced payment, it will be limited only up to 20% of the total price quoted. For any higher percentage, or advanced payment of*

	☒ 70% upon complete installation and commissioning of the system ☒ 10% after 6 months of stabilization period. Maintenance ☒ ⅓ at the end of the 1st year ☒ ⅓ at the end of the 2nd year ☒ ⅓ at the end of the 3rd year
Liquidated Damages	
Evaluation Criteria *[check as many as applicable]*	☒ Technical responsiveness/Full compliance to requirements and lowest price[7] Comprehensiveness of after-sales services ☒ Full acceptance of the PO/Contract General Terms and Conditions *[this is a mandatory criteria and cannot be deleted regardless of the nature of services required]* ☐ Earliest Delivery / Shortest Lead Time[8] ☐ Others *[pls. specify]*
UNDP will award to:	☒ One and only one supplier ☐ One or more Supplier, depending on the following factors: *[Clarify fully how and why will this be achieved. <u>Please do not choose this option without indicating the parameters for awarding to multiple Suppliers]</u>*
Type of Contract to be Signed	Purchase Order
Special conditions of Contract	☐ Cancellation of PO/Contract if the delivery/completion is delayed by *[indicate number of days]* ☐ Others *[pls. specify]*

$30,000 or higher, UNDP shall require the vendor to submit a bank guarantee or bank checque payable to UNDP, in the same amount as the advanced payment made by UNDP to the vendor.

[7] *UNDP reserves the right not to award the contract to the lowest priced offer, if the second lowest price among the responsive offer is found to be significantly more superior, and the price is higher than the lowest priced compliant offer by not more than 10%, and the budget can sufficiently cover the price difference. The term "more superior" as used in this provision shall refer to offers that have exceeded the pre-determined requirements established in the specifications.*

[8] *This shall be used for time-critical and/or exigent requirements (e.g., post-crisis emergencies, elections, etc.).*

Conditions for Release of Payment	1st installment: 20% of total acquisition ☒ Written Acceptance of Goods based on inspection and full compliance with RFQ requirements 2nd installment: 70% of total acquisition Upon commissioning of the system as per Annex 1, section 3.7.1.7 ☒Submission of Deliverables ☒ Passing Inspection ☒ Complete Installation ☒ Passing all Testing (including UAT) ☒ Completion of Training on Operation and Maintenance and online monitoring. 3rd installment: 10% of total acquisition ☒ after 6 months of the total stabilization period 1st installment: ⅓ of total maintenance ☒ Deliver of 1st and 2nd visit report and checklist 2nd installment: ⅓ of total maintenance ☒ Deliver of 3rd and 4th visit report and checklist 3rd installment: ⅓ of total maintenance ☒ Deliver of 5th and 6th visit report and checklist
Annexes to this RFQ[10]	☒ Specifications of the Goods Required (Annex 1) Form for Submission of Quotation (Annex 2) General Terms and Conditions / Special Conditions (Annex 3). ☐ Others *[pls. specify, if any]* Non-acceptance of the terms of the General Terms and Conditions (GTC) shall be grounds for disqualification from this procurement process.

[10] *Where the information is available in the web, a URL for the information may simply be provided.*

Contact Person for Inquiries (Written inquiries only)[11]	*procurement.ht@undp.org* *and* itm.green.energy@undp.org Any delay in UNDP's response shall be not used as a reason for extending the deadline for submission, unless UNDP determines that such an extension is necessary and communicates a new deadline to the Proposers.

Goods offered shall be reviewed based on completeness and compliance of the quotation with the minimum specifications described above and any other annexes providing details of UNDP requirements.

The quotation that complies with all of the specifications, requirements and offers the lowest price, as well as all other evaluation criteria indicated, shall be selected. Any offer that does not meet the requirements shall be rejected.

Any discrepancy between the unit price and the total price (obtained by multiplying the unit price and quantity) shall be re-computed by UNDP. The unit price shall prevail and the total price shall be corrected. If the supplier does not accept the final price based on UNDP's re-computation and correction of errors, its quotation will be rejected.

After UNDP has identified the lowest price offer, UNDP reserves the right to award the contract based only on the prices of the goods in the event that the transportation cost (freight and insurance) is found to be higher than UNDP's own estimated cost if sourced from its own freight forwarder and insurance provider.

At any time during the validity of the quotation, no price variation due to escalation, inflation, fluctuation in exchange rates, or any other market factors shall be accepted by UNDP after it has received the quotation. At the time of award of Contract or Purchase Order, UNDP reserves the right to vary (increase or decrease) the quantity of services and/or goods, by up to a maximum twenty five per cent (25%) of the total offer, without any change in the unit price or other terms and conditions.

Any Purchase Order that will be issued as a result of this RFQ shall be subject to the General Terms and Conditions attached hereto. The mere act of submission of a quotation implies that the vendor accepts without question the General Terms and Conditions of UNDP herein attached as Annex 3.

UNDP is not bound to accept any quotation, nor award a contract/Purchase Order, nor be responsible for any costs associated with a Supplier's preparation and submission of a quotation, regardless of the outcome or the manner of conducting the selection process.

[11] *This contact person and address is officially designated by UNDP. If inquiries are sent to other person/s or address/es, even if they are UNDP staff, UNDP shall have no obligation to respond nor can UNDP confirm that the query was received.*

Please be advised that UNDP's vendor protest procedure is intended to afford an opportunity to appeal for persons or firms not awarded a purchase order or contract in a competitive procurement process. **In the event that** you believe you have not been fairly treated, you can find detailed information about vendor protest procedures in the following link:

http://www.undp.org/content/undp/en/home/operations/procurement/protestandsanctions/

UNDP encourages every prospective Vendor to avoid and prevent conflicts of interest, by disclosing to UNDP if you, or any of your affiliates or personnel, were involved in the preparation of the requirements, design, specifications, cost estimates, and other information used in this RFQ.

UNDP implements a zero tolerance on fraud and other proscribed practices, and is committed to identifying and addressing all such acts and practices against UNDP, as well as third parties involved in UNDP activities. UNDP expects its suppliers to adhere to the UN Supplier Code of Conduct found in this link : http://www.un.org/depts/ptd/pdf/conduct_english.pdf

Thank you and we look forward to receiving your quotation.

Sincerely yours,

Sekou Bangoura

Operations Manager

October 13, 2022

United Nations Development Programme
Information & Technology Management
Smart Infrastructure Services

Haiti UNDP Country Office Solar PV Expansion

Annex 1 - Terms of Reference:

Solar Hybrid System for the Haiti UNDP Country Office, contributing to Create Smart UN Facilities Powered by Renewable Energy

Solar PV Capacity (kWp)	Battery Capacity (kWh)	Renewable Fraction (%)	CO_2 Reductions (tons/year)
15	80	67.1	51.9

About

Prepared 03/09/2022
Last Update: 14/09/2022 by ITM Green Energy Team.

ISO 9001 *Approved for Release by*
Gerald Demeules
Global ICT Advisor

◀ **Front Cover:** Solar PV Potential Model for UNDP Haiti County Office

Terms of Reference: Solar Hybrid System

UNDP Haiti Country Office

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Acronyms

AI - Artificial Intelligence
COB - Close of Business
GHG - Green House Gas
HQ - Head Quarters
ICT - Information and Communications Technology
IoT - Internet of Things
O&M - Operation and Maintenance
ITM - Information and Technology Management
PCMM - Power Consumption Measuring and Monitoring
PSU - Procurement Services Unit
SDGs - Sustainable Development Goals
TOR - Terms of Reference
UAT - User Acceptance Test
UNDG - United Nations Development Group
UNDP – United Nations Development Programme

Terms of Reference: Solar Hybrid System

Haiti UNDP Country Office

Scope of the Document

The Terms of Reference (TOR) sets the requirements to facilitate smart and clean energy solutions to secure country office (CO) activities in UNDP Haiti by supplying, installing, commissioning (including complete civil works), and after-sales services for a solar hybrid system powering the country office's **critical load**. An overall high-quality system is expected, as the system will be a showcase for other compounds.

Structure of the Document

The ToR include the following components:

1. Introduction
2. Project Description
3. Statement of Work
4. Price and Delivery Schedule Forms
5. Project Management and Communication Plan

All the requirements included in this ToR are numbered and boxed.

1. Introduction

The **UNDP Haiti CO**, in cooperation with the UNDP Information & Technology Management (ITM) Green Energy Team, has taken initial steps toward implementing a solar installation on their premises. This endeavor will comprise **of 15kWp solar PV with an 80 kWh Lithium-Ion battery** system to power the country's office's **critical load** (server room and safety equipment).

The CO's critical load has been estimated from PCMM sensors, local energy resources, and data provided by the UNDP Haiti colleagues in the site survey assessment. Based on the projection of the load consumption, the new hybrid solar system will be able to cover approximately 67.1% of the CO's critical electricity consumption thereby keeping the CO's business process operational during outages.

Switching to renewable energy implies strong environmental incentives. Going solar will save approximately 51.9 tons of CO_2 emissions yearly, effectively reducing Haiti UNDP CO's carbon footprint and environmental burden. This will institute the United Nations Sustainable Development Goals while being an opportunity to promote green energy solutions and inspire local communities to adopt similar solutions. Moreover, a solar installation in Haiti UNDP CO will enhance business continuity and work environment, as well as reduce climate impact all while promoting sustainable development in the region.

1.1 Sustainable Development Goals

The Sustainable Development Goals (SDGs) are the blueprint for achieving a better and more sustainable future for all. They address the global challenges we face, including poverty, inequality, climate, environmental degradation, prosperity, and peace and justice. The Goals interconnect, and to leave no one behind, we must achieve each Goal and target by 2030.[12] As a leading agency in the fight against climate change, UNDP is committed to "walking the talk" by demonstrating that we run our operations in a resources-efficient, sustainable, and accountable way.

Figure 1 - The Global Goals for Sustainable Development

Substantial progress has been achieved in making UNDP "greener," more resilient operations both at Head Quarters and in many COs and Regional Centers. Around the world, our offices are working to minimize the environmental impact associated with operations, from green building renovations and sustainable procurement practices to staff training and bicycling programs. By now, over 20 UNDP COs – out of 167 - have installed or are installing photovoltaic systems to reduce Green House Gas (GHG) emissions and enhance office energy security. Recently UNDP adopted a 'Climate Neutrality and Sustainability Plan for Global UNDP Operations' committing UNDP to reduce GHG emissions by 10% over five years and achieving climate neutrality for global operations starting effective 2014 [13].

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[12] About the Sustainable Development Goals (https://www.un.org/sustainabledevelopment/sustainabledevelopment-goals/

[13] UNDP - Greening the Blue Initiative (http://www.greeningtheblue.org/what-the-un-is-doing/unitednationsdevelopment-programme-undp)

1.2 Smart UN Facilities

The concept of Smart UN Facilities revolves around using data insights and interconnected technologies to transform UN COs and related facilities into "smart" premises; in effect, local capacity to carry out the UN's goals is augmented. This concept is rooted in two aspects, which are manifested in multiple technology systems provided by ITM:

1. Fourth Industrial Revolution – the advent of connected technologies, including robotics, the Internet of Things (IoT), and autonomous vehicles.
2. Smart cities – utilization of sensors for data collection, insights, analysis, and subsequent enhancement of services.

Given the benefits, it makes the first step in transitioning into a low-carbon and digital organization through the smart integration of various equipment. As it is depicted below, Figure 2 shows the main technologies that set and establish Smart UN Facilities, including:

- Smart Energy & Mobility
- Smart Connectivity - ICT, Business Intelligence & AI
- Smart Data & Internet of Things
- Smart Security

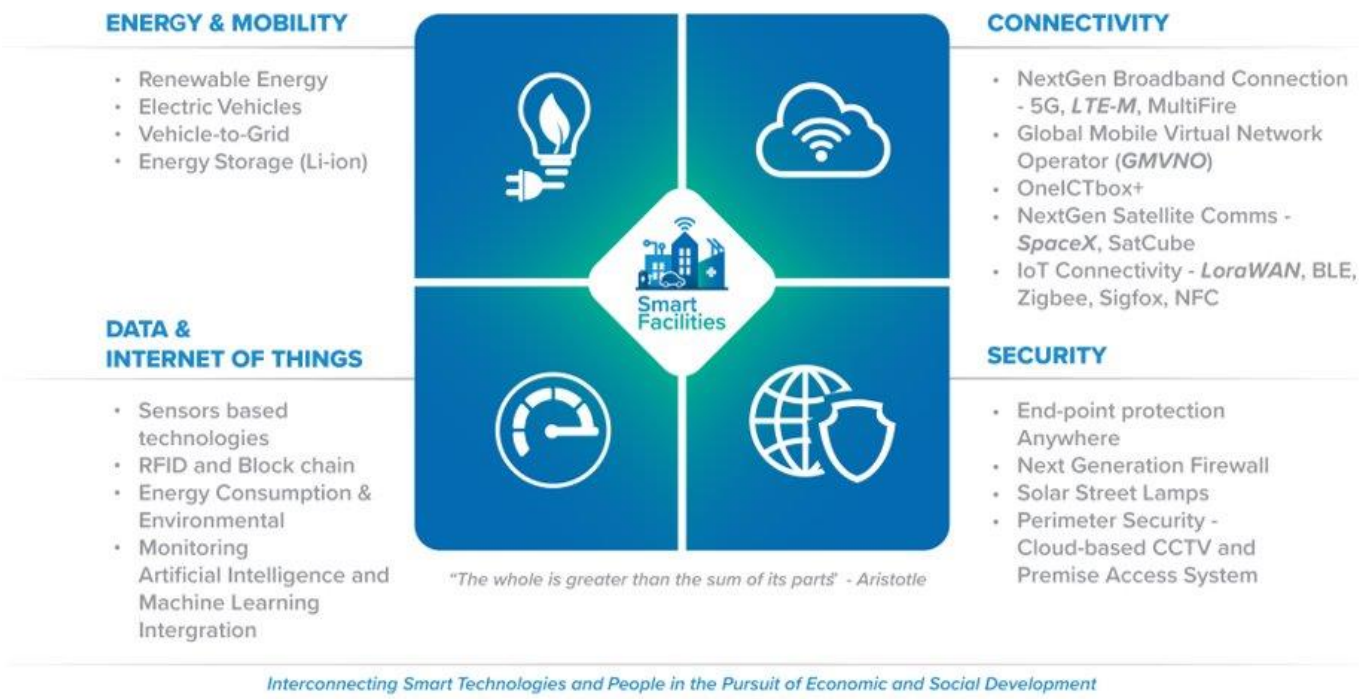

Figure 2 - Smart UN Facilities Framework

1.3 Seven Step Green Energy Process

Use of the United Nations Development Group's recommended 7-Step process is being adopted for this project. The approach is a holistic end-to-end process with a preliminary assessment of project

practicability and the post-installation operation & maintenance. This solution is depicted in Figure 3 below and elaborated in the subsequent text.

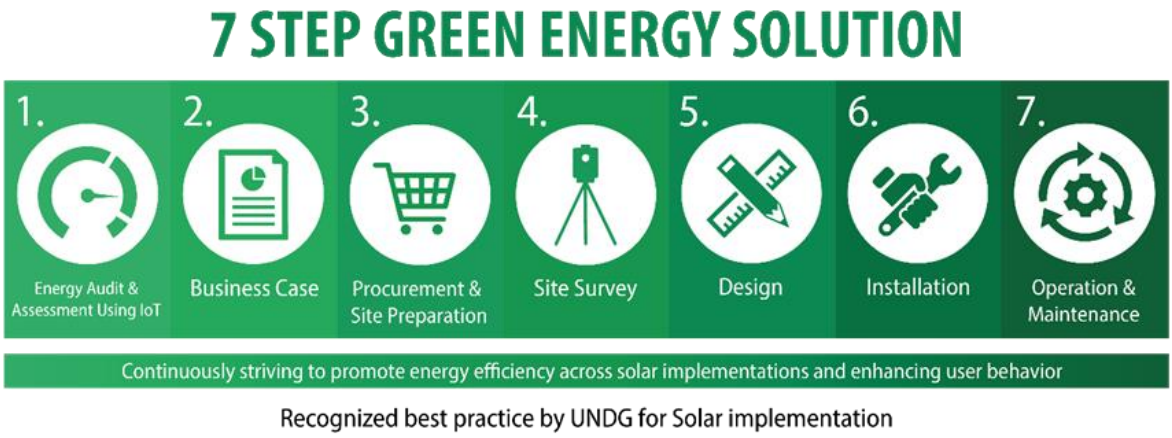

Figure 3 - Seven Step Green Energy Solution

Step 1: Energy Audit & Assessment using IoT

a. The CO installs Internet of Things (IoTs) devices to measure their load consumption, if applicable.
b. ITM monitors the quality of the grid and generator(s). The proposed solution for the solar PV system should be compatible with this monitoring system.
c. The CO is required to complete a **Preliminary Site Survey** form, which will provide detailed information on the physical structure and the electrical installations.
d. The CO can choose to have a technical assessment mission to carry out the Preliminary Site Survey of the premises.

Step 2: Business Case

a. This step serves to provide essential information and data for decision-making. With the information gathered during Assessment using IoT and CO schematics, ITM compiles a load profile of the energy consumption for the respective CO. This enables an analysis resulting in the drafting of a business case that presents potential green energy solutions for the CO.

Step 3: Procurement & Site Preparation

a. Compilation and publication of solicitation documents will be carried out in accordance with UNDP rules as applied by PSU in such projects.
b. Before the bids are placed, all interested vendors perform a **Site Visit** to collect all the detailed data required for them to formulate their offer.
c. Evaluation of bids/proposals will be carried out jointly between ITM, CO, PSU, and if desired a government representative/focal point.

Step 4: Site-survey – vendor

a. The vendor carries out a **Site Survey** to exhaustively consider all aspects that can adversely affect the implementation of the project and information for the final project's design, including required materials/equipment and time frames.
b. The vendor acts as the implementer, working closely with the focal point at the CO, where necessary, and ITM exercises technical oversight and project management. Submission of the final **Site Survey Report** marks the end of this step.

Step 5: Design

a. The selected vendor drafts the final system design, considering findings from the site survey in the previous step.
b. As part of technical oversight, ITM must endorse the final design before the actual installation starts. Submission of the final design and implementation schedule marks the end of this step.

Step 6: Installation

a. The vendor carries out all the necessary installations, in the process giving regular progress updates to all stakeholders.
b. Critical milestones are defined, at which point, ITM makes the necessary assessments as part of the technical oversight.
c. Six-month stabilization period allows the end-user to get acquainted with the system and basic troubleshooting.
d. Among other critical requirements, the step entails end-to-end testing, physical inspection of the installation, user training, and complete system documentation.
e. This step involves carrying out User Acceptance, in which all parties play a role. A signed checklist confirming full compliance with all requirements marks the end of the step, giving way to Operation & Maintenance (O&M).

Step 7: Operation & Maintenance

a. Regular bi-annual maintenance (the first 3 years of maintenance is included in the quote presented in the business case) and regular monitoring from UNDP.

Communication and Publicity

Parallel to the Seven Step Green Energy Solution process of green energy solution, ITM Communications Team and the Communications CO Team carry out the promotions of the successful project within the country and globally through the UN network. This process involves highlighting the benefits of the installed system and spread word about the human impact. Furthermore, this aims at motivating similar installations in other parts of the country.

2. Project Description

2.1 Project Objectives

The main goal of the smart solar hybrid system is to provide an **affordable and reliable green energy** solution powering the UN smart facility's **critical load** as well as **smart integrated services** like security and adaptability. ITM requires **high quality** for the system as it will also serve as a showcase on a national and international scale. The following document provides requirements and guidelines for the project, but an innovative solution proposal is highly encouraged to improve the system.

2.2 Project High Level Requirements

This project seeks to enhance the UNDP premise's critical energy supply with renewable energy. The current energy supply for the compound is based on two diesel generators, a 297 kVA primary genset and another 186 kVA backup generator, and a very unreliable grid. The generators are used daily to power the CO; however, the generator maintenance is out of the scope of this RFQ.

The requirement is for the vendor to provide a comprehensive offer for a **Hybrid Solar PV Turnkey Solution** based on the following configuration.

1. Supply a **15 kWp Solar PV Turnkey Solution inclusive of 80 kWh Lithium-Ion Battery Solution**.
2. Installation, User Acceptance Test (UAT), and commissioning of the final system.
3. Integration of the final solution into the facility and the national grid.
4. Provision of bi-annual maintenance and after-sales by the local partner (for 3 years).
5. Training of the users on the system must also be provided to guarantee they will be able to perform the system's first-level operation and maintenance effectively.

The hybrid setup will be based on **Solar PV + Grid + Batteries + Generator(s)**. The Solar PV System is required to serve as the primary energy source with the grid to power the Haiti UNDP CO's **critical load**. During outages, the system will use the battery and the diesel generators to meet the energy requirements (e.g., daytime). The battery will be optimized to charge on energy excess from the solar PV panels or the generators. Whenever the diesel generators are required to meet the energy requirements, the goal is to optimize its usage in an efficient way where the working load and batteries can be charged at the same time.

The hybrid solar PV system is expected to provide around 67.1 % of the critical electricity demand of the Haiti UNDP CO. A set of energy efficiency measures (out of the scope of this RFQ) have also been suggested (sealing openings, increasing temperature set on ACs, and providing motion sensors for ACs), which means the CO can potentially reduce its current consumption, therefore, increasing the system's renewable fraction.

The Solar PV + Grid + Batteries + Generator(s) system must operate in a robust, intelligent, and automated manner regarding energy supply for the CO's critical load. The system's proposal shall

include an intelligent energy supply and management, prioritizing PV, and if more energy is required, supply with either the batteries or generator, depending on the battery SOC.

The weather in Haiti has many variations, and due to its location, the area is prone to earthquakes, hurricanes, and geological activities (See section 2.4 Weather on Site). Hence, the system installed must be designed and installed to withstand these harsh climatic conditions.

Please note that civil works can be one of the most sensitive parts of the project. It involves safety and dominant physical visibility directly impacting **UNDP's reputation** and functionality of a parking structure. The mounting structure becomes the signature and a showcase of the UN compound, as civil work will significantly alter the looks of UN facilities. The solar panel installation will become part of the UN compound signature. As per the UNDP Smart Facility vision, all results of civil work will become a showcase to inspire a movement locally and hopefully regionally.

2.3 Site Description

The Haiti UNDP CO premises are located at: 14, Rue Reimbold, Bourdon, B.P. 557, Port-Au-Prince, in the following GPS Coordinates: 18.536998, -72.306544. The hybrid solar system will need to cover CO's critical load. The compound's roof plan is shown below in Figure 4. A storage area is available on the CO's premises to place the goods during the installation. However, space may be limited, and the vendors must assess any security issues linked to the equipment's storage on-site.

Figure 4 - Aerial view of the UNDP Premises in Bourdon, Haiti

2.4 Weather on Site

Haiti lies in the zone of tropical trade-wind climate with relatively minor seasonal shifts. As shown in Figure 5, the average daily temperatures range between 24 to 28°C, with a cooler period from November to March. The day length is around 7 to 9 hours throughout the whole year. In Port-au-Prince, a total of 1 250 millimeters of rain falls per year, and precipitations are the heaviest during the rainy season lasting from April to October. Dust can also be a significant inconvenience as the wind speed is regularly above 15 km per hour.

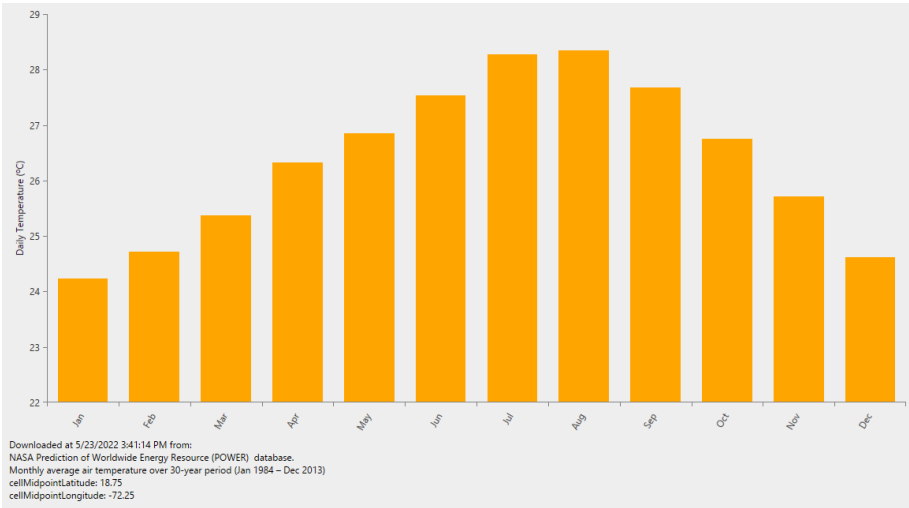

Figure 5 - Monthly temperatures in Bourdon, Haiti

Haiti is exposed to a broad spectrum of natural disasters such as floods, hurricanes, and earthquakes. Indeed, the country lies in the middle of the hurricane belt, making it subject to severe storms during the regular hurricane season from June through November. Therefore, the new hybrid solar system must be designed to ensure maximal security and resist extreme weather events or natural disasters as much as possible.

2.5 Potential Location of PV Panels

The solar panels are suggested to be located on the UNDP CO's roof. The suggested layout for the PV modules is shown in Figure 6; however, vendors shall propose any other layout in the roof achieving necessary PV production while minimizing structural impacts.

Figure 6 - Proposed area for PV panels on the UNDP Haiti County Office

2.6 Potential Location for the Technical Room

The hybrid system's technical room shall be provided as a containerized solution or cabinet, following the specifications described in section 0. The containerized solution should be placed in the area shown in Figure 7. This area's dimensions must be evaluated during the Site Visit.

Figure 7 - Proposed location for the containerized technical room solution

2.7 Estimated Load Consumption

PCMM sensors were installed to measure the consumption of the CO's critical load, which powers the facility's server room and safety equipment. Through these devices, several months of consumption data was collected. Using the data from the PCMM sensors, a yearly load profile was generated. Day-to-day and seasonal variability have been included to provide the most realistically possible load estimation. The final load profile used for the simulations is shown in Figure 8 and Table 1.

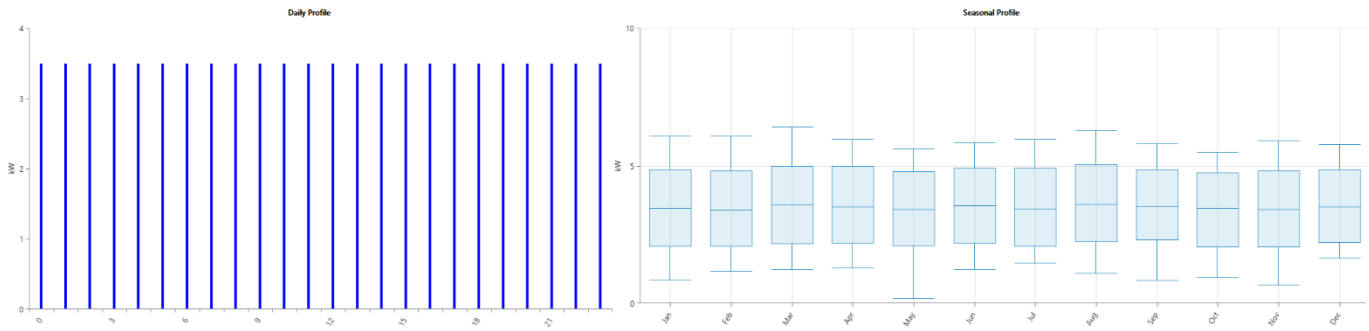

Figure 8 – UNDP Haiti CO's critical load profile

Table 1 - Load Profile Metrics

Metric	Baseline
Average (kWh/day)	84
Average (kW)	3.5
Peak (kW)	6.42

2.8 Connectivity

The UNDP Haiti CO has connectivity in place, both ethernet and wi-fi connection.

2.9 Generators

Two diesel generators, shown in Figure 9, provide power to the UNDP CO. The main generator, SMDO V250U, purchased in 2016, has a 238 kW power capacity. Due to poor grid quality, this main genset is manually turned on during the day, usually from 6 AM to 6/7 PM, to supply the CO with electricity. The backup generator, SMDO J150U, installed in 2012, has a 149 kW power capacity. Figure 10 and Figure 11 summarize both generators' specifications. An Automatic Transfer Switch (ATS) selects the CO's power supply source according to the grid's availability. Both generators remain in the OFF position when the CO is closed at nighttime and during weekends.

Figure 9 – Main and backup diesel generators

KOHLER-SDMO V250U Industrial Generator Specifications:

Dimensions [L × W × H] (mm)	2900 × 1300 × 1586
Frequency (Hz)	60
Power (kW)	238
Voltage (V)	220/127
Power (kVA)	297
rpm	1800
Fuel	Diesel
Bore (mm)	108
Stroke (mm)	130
Displacement (liter)	7.15
Weight (kg)	2172
Fuel Consumption (liter/hr)	64
Phase	3
Engine Brand	VOLVO TAD734GE
Compression Ratio	17.1
Fuel Tank Capacity (liter)	390

Figure 10 - KOHLER-SDMO V250U generator datasheet

KOHLER-SDMO J150U Industrial Generator Specifications:

Dimensions [L × W × H] (mm)	2497 x 1103 x 1524
Frequency (Hz)	60
Power (kW)	149
Voltage (V)	220/127
Power (kVA)	186
rpm	1800
Fuel	Diesel
Bore (mm)	106
Stroke (mm)	127
Displacement (liter)	6.72
Weight (kg)	1375
Fuel Consumption (liter/hr)	41.50
Phase	3
Engine Brand	JOHN DEERE 6068HFG20-153
Fuel Tank Capacity (liter)	334

Figure 11 - KOHLER-SDMO J150U generator datasheet

2.10 Grid Quality

The grid quality in Haiti was assessed using data collected from the Preliminary Site Survey. Based on the collected data, the national grid is very **unreliable** with outages occurring approximately four times per day, lasting on average 3 hours.

2.11 Existing Solar PV System

The 5 kWp solar system, shown in Figure 12 below, has been installed in the UNDP Haiti CO in 2018. This system is comprised of 16 solar modules (315 Wp - RS315M6-72) placed on the CO's roof. The solar array relates to two 3 kW inverters (M3000H) that serve the CO's UPS/Backup system and height Crown CR-430 battery banks. **However, please note the existing solar system should not be integrated with the new hybrid system.**

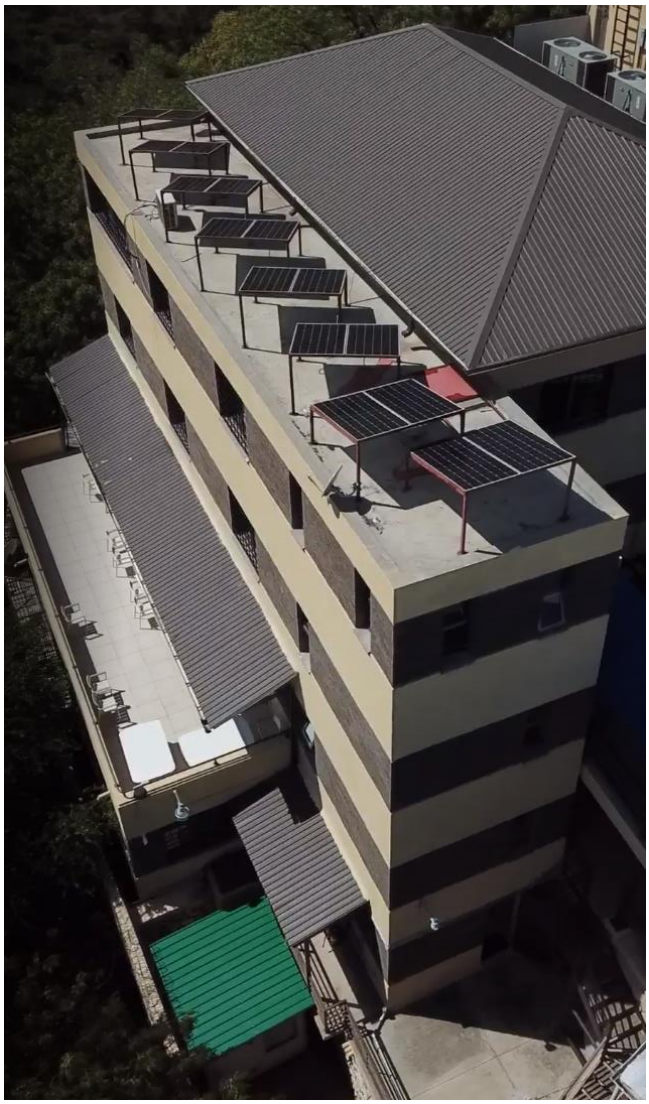

Figure 12 - Existing solar PV system

3. Statement of Work

3.1 Local Partner

In case the vendor is not located within a reasonable distance to allow for a response time within the maximum time specified in Table 4, it must show proof of a formal agreement with a local representative with relevant experience to perform such requirements. **This agreement is designed for support in the deployment of the Solar System with regards to the site visit, installation, and after-sales services and maintenance processes**[14]. This aligns with UNDP's mission of developing local capacity. In case the vendor is based within a reasonable distance from UNDP Haiti CO and can ensure to meet the required response times, a local partner is not necessary. **Please note that an exclusivity agreement with the local partner is not a requirement.**

In case the vendor wishes to partner with a local representative, please include the following in the offer document:

1. Letter signed by both parties, confirming the relationship between vendor and local partner.
2. Profile of the local partner, including documentary evidence of relevant experience and services.
3. Official documentation stating that the Local Partner is a registered business in the country.

Both the vendor and the local partner need to agree to the maintenance terms discussed in ***section 0,*** **and must be aware of the high-quality expectations for the solution, as the system will serve as a showcase at both national and international levels.** This needs to be proved through a signed document stating the mentioned points.

Note that the vendor is responsible for the requirements mentioned in section 0 and not the local partner. As the local partner may be required to go on-site during the O&M phase for corrective maintenance and troubleshooting, it should be based in a strategic location within proximity to the CO.

3.2 After-sales services and response time

Represented by the local partner, the vendor must be able to comply with the minimum requirements for after-sales services and maintenance processes. The logistics should allow for a response time within the maximum time specified in Table 4. In case of a critical incident, the vendor/local partner shall acknowledge the issue and perform the required activities depending on the identified incident priority. The target resolution and response time for each Incident or Service Request depends on its Priority. Priority is determined by the Urgency and the Impact of the Incident or Service Request.

The response shall always include:

1. Acknowledge receipt of incident reporting.
2. Assess and evaluate Urgency as detailed in Table 2.

[14] Please refer to Section 3.6 for vendor's tasks and responsibilities

3. Assess and evaluate Impact as detailed in Table 3.
4. Commence implementing resolution actions with the timelines and modalities indicated below for each resulting priority.

Resolution shall always include:

1. Clear identification of incident.
2. Clear identification of incident causes.
3. Submission of resolution plan with clear activities and timelines.
4. Submission of request for procurement of any component's replacement.
5. Initiation of resolution plan activities.

The below tables and definitions describe the service agreed on targets and expected response time. The Priority defined in Table 4 results in a combination of Urgency and Impact. As depicted in Table 2, Urgency is defined as a measure of how long it will be until the incident has a significant impact on the business.

Table 2 - Urgency level definition

Urgency	Description
Critical	Event underway, it cannot be stopped or changed.
High	Event underway, time to resolution to be kept to a minimum.
Medium	Event scheduled or to occur, but enough time remains to respond without impacting the event.
Low	Event can be postponed or is far enough away in time to allow response without loss of productivity.

Impact, detailed in Table 3, is defined as a measure of the effect of an incident and how the service levels will be affected.

Table 3 - Impact Level Definition

Impact	Scope	Business	Operations
Extensive Widespread	80% to 100% Generation is lost. Incapacity to correctly feed the load from both direct generation and/or battery storage	The event has extensive financial implications, the longer the issue takes to be resolved.	Interferes with core business functions, loss or potential loss of electricity supply.
Significant Large	Affects a significant part of the hybrid system. More than 50% to 80% power loss or battery capacity loss.	Some financial impact and few business units are impacted.	Interferes with few core businesses functions and potential loss of mission critical data.
Moderate Limited	Affects a minor part of the hybrid system. less than 50% power loss or battery capacity loss.	No financial impact but potential loss later if unresolved.	Interferes with non-core business functions and no loss on mission critical data.
Minor Localized	Less than 10% or no power or battery capacity loss.	No financial impact and no potential loss or economic implications.	Interferes with non-major business activities and no loss on mission critical data.

Once Urgency and Impact are evaluated, the Priority is determined with the corresponding Response and Resolution Time.

Table 4 - Priority definition and target response time

Impact	Urgency	Resulting Priority	Response Time Target and mandatory action[1]	Resolution Time Target
1-Extensive Widespread	1-Critical	**Critical**	2 hours – On site presence is required	48 hours
2-Significant Large	1-Critical	**Critical**	2 hours – On site presence is required	48 hours
1-Extensive Widespread	2-High	**Critical**	2 hours – On site presence is required	48 hours
3-Moderate Limited	1-Critical	**High**	12 hours – On site presence is required	72 hours
4-Minor Localized	1-Critical	**High**	12 hours – On site presence is required	72 hours
2-Significant Large	2-High	**High**	12 hours – On site presence is required	72 hours
1-Extensive Widespread	3-Medium	**High**	12 hours – On site presence is required	72 hours
3-Moderate Limited	2-High	**High**	12 hours – On site presence is required	72 hours
4-Minor Localized	2-High	**Medium**	24 hours – On site presence is required	6 days
2-Significant Large	3-Medium	**Medium**	24 hours – On site presence is required	6 days
3-Moderate Limited	3-Medium	**Medium**	24 hours – On site presence is required	6 days
4-Minor Localized	3-Medium	**Medium**	24 hours – On site presence is required	6 days
1-Extensive Widespread	4-Low	**Low**	48 hours	10 days
2-Significant Large	4-Low	**Low**	48 hours	10 days
3-Moderate Limited	4-Low	**Low**	48 hours	10 days
4-Minor Localized	4-Low	**Low**	48 hours	10 days

[1] *Response time specified taking into consideration regular working hours schedule*

3.3 Site Visit

Necessary site information, including photos, has been provided. However, for the preparation and submission of your offer, you shall engage your local partner or defined representative to conduct a Site Visit (without cost to UNDP). The data collected on the site assessment visit and the data included in this document shall be considered for the offer preparation and submission.

The Site Visit is scheduled for Error! Reference source not found.**2 (2 pm local time)**. The Site Visit can be conducted either by the vendor's staff, the local partner, or a third representative. Conducting a site visit is **compulsory** for the offer to be valid.

Please note that it is necessary to arrange the site visit in advance. As such, the vendors must inform its local partner accordingly.

Please confirm your intention to undertake Site Visit(s) (without cost to UNDP**) by 28284th OctoberOctober 202 COB (Copenhagen Time)** by sending an email to: itm.green.energy@undp.org, procurement.ht@undp.org, and registry.ht@undp.org.

Kindly **provide in the email the following information** for UNDP Haiti CO and UNDP PSU/ITM to make the necessary arrangements for assessment.

Confirmation of site visit on the 04/11/2022 at 16:30hrs Haiti time	
e of company/local partner undertaking site visit	
Name of visitor, ID and contact details	
Please refer to the address stated in this RfQ:	**United Nations Development Programme, 14, Rue Reimbold, Bourdon Port-au-Prince, Haiti**

3.4 Bidders Conference

The **bidders' conference** aims to provide an open exchange between UNDP ITM and vendors, communicate the RFQ process to vendors, answer questions about the RFQ and ultimately ensure that prospective vendors have a clear understanding of the requirements. The conference will be conducted with interested vendors over a video conference, and the vendors' participation is mandatory for bidding.

The bidders' conference is scheduled on the Error! Reference source not found.**2 at 15:00 CET.**

Please confirm your participation **by 28284th OctoberOctober 2022 COB (Haiti Time)** by sending an email to: procurement.ht@undp.org and itm.green.energy@undp.org

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3.5 Technical Requirements

Compliance with or deviations from the specification shall be clearly stated by the vendor in the below sections (0 - 0) and submitted as part of the offer (*Please refer to Appendix I*). The vendor shall apply good engineering practices and follow the applicable standards in the solar PV system's design. In addition, the vendor shall include technical and performance specifications of the equipment that will be used in the project. The system's electricity supply is expected to operate according to the follow logic/priorities shown in Figure 1313, also further specified in section 0.

Figure 13 - System's operation logic

3.5.1 PV Modules

Table 5 - PV Modules Technical Requirements

3.5.1.1	**PV Capacity**	Total PV capacity of **15 kWp**.
3.5.1.2	**Module Specifications**	Solar PV Panels shall follow these technical and performance specifications: i. Mono- or polycrystalline silicon; CIGS thin film modules are also acceptable ii. PV Panels with enough number of cells and energy efficiency ensuring the system offered has the capacity requested iii. Tolerance better than -0/+5% iv. Maximum weight per module 28 kg (>28kg modules may be accepted as long as the total weigh of the structure does not compromise the integrity of the roof) v. Frameless modules are not allowed vi. Double insulation module with cables and connectors vii. Junction box with accessible bypass diodes viii. Anti-reflective glass cover ix. Modules must be PID (potential induced degradation) proof, or have passed the IEC 62804 standard test
3.5.1.3	**Standards**	i. Compliant with IEC 61215 (edition 2) or equivalent ii. Shall be qualified and be classified by class according to IEC 61730 or equivalent
3.5.1.4	**Module Efficiency**	Minimum shall be 18%.
3.5.1.5	**Limited Power Warranty**	The modules shall be subject to a 10-year limited product warranty or longer. The performance warranty shall ensure that the modules will produce at least 90% of their nominal power after 10 years and 80% of the nominal power after 20 years.
3.5.1.6	**Voltage rating**	Shall be compatible with the battery voltage. Mismatch losses to be considered.
3.5.1.7	**Disconnecting means**	Shall be provided for the PV generator to isolate it from the battery safely when needed.
3.5.1.8	**Tilt**	Shall be optimized for local condition and used technology.
3.5.1.9	**Labelling**	The bidder shall provide the following information at the project completion: i. Manufacturer, brand; model and serial number

		ii. Rated power; Efficiency iii. Color temperature iv. Clear indication of the connecting inlets and outlets v. Warranty and Safety warning

3.5.2 PV Modules mounting

Table 6 - PV modules mounting technical requirements

3.5.2.1	**Features**	In this regard, vendors are requested to provide complete appropriate solution including supply of materials, civil works etc. as part of the Haiti UNDP CO's hybrid solar system. On the top of buildings with a pitched roof the modules can be directly mounted on the roof. Otherwise, the tilt angle and azimuth of the modules are to be optimized to the production in relation to the needs and the local conditions. Shadowing of the PV modules from trees, buildings or any other obstacles should be minimized over the whole day and there shall be no shadows in a period of ± 4h w.r.t. solar noon. Bidders are requested to provide the solar field layout drawings of their solution coupled to a calculation of the required area (size) for Solar PV Modules in the offered system, as well as provide energy production forecast based on the orientation, tilt, and shadowing effects for Solar PV Modules. Any changes to the preliminary design of the mounting structure may be provided after the detailed site survey and the final design shall be approved by UNDP.
3.5.2.2	**Mounting Structure**	i. The new solar system including panels, racking, connections, and other components shall be designed in accordance with the loading criteria of the 2012 International Building Code and Haitian National Building Code, 2012 edition (herein after referred to as "code"). ii. Mounting structures and the connections to the base building shall be designed and customized in accordance with the IBC code to withstand local weather and climate, structural loads such as solar panels, wind loads, seismic loads (dependent on location), etc. iii. If applicable, the foundation and structural design shall be designed and signed by a licensed engineer. The evaluation shall be in accordance with the IBC code. The detailed drawings shall be provided, indicating total dimensions. iv. The mounting structure shall be aesthetically pleasing, use local materials (if possible) that adhere to quality standards and materials that have low embodied energy.

		v. The material of the structure shall be anodized aluminum 6005 T6 stainless steel 304 or of equivalent quality vi. Easy access to solar panels is required for regular cleaning and maintenance of the solar panels. vii. Distance between rows, if applicable, shall be designed to minimize shading losses while allowing optimal utilization of the available space. viii. The panels and supporting structure shall be designed for a wind speed (V1700) of at least 160 mph. ix. Penetrations through existing elements shall not have an adverse effect on the existing building structure. x. If top-down clamps are required, clamps that hold modules individually or independently shall be used. xi. Bolt hardware shall be vibration-resistant and appropriate for the environment and workforce. xii. Self-tapping screws for structural connections shall not be accepted. xiii. Ballasted-only systems are not allowed due to the high risk of cascading failure modes. All mounting structures shall have positive mechanical attachments to the building structure. xiv. **Structural engineering analysis** should be performed in accordance with ASCE 7 (from IBC code) and site conditions, **with sealed calculations for wind forces, reactions, and attachment design.** xv. The vendor should guarantee that the solar installation should not cause any water leakage or any damage to the roof which might incur during the installation phase as well as later after the solar system is commissioned and fully functioning. xvi. The BoM considered for the structure shall be included in the technical drawings.
3.5.2.3	**Lifespan**	Mounting structure should last at least the lifespan of project (25+ years).
3.5.2.4	**Tilt**	Shall be optimized for local condition and used technology.
3.5.2.5	**Standards**	The design of the PV mounting structure/array should follow the guidelines specified in JIS C 8955:2011, AS/NZS 1170.2:2011 or equivalent. UNDP reserves the right to crosscheck the features. The design and installation should respect and meet the recommendations specified by the solar panels' installation guideline.

3.5.3 Power electronics

Table 7 - Power electronics technical requirements

3.5.3.1	**Features**	The system must include a smart inverter and controller to control the solar PV output, the battery charging and discharging and the external power sources output (grid/generator). Additionally, the power electronic and BOS devices should include protection and power quality devices that counter problems like power back flow to the generator due to solar production. The generators must be protected from reverse current.
3.5.3.2	**Inverter Specifications**	Solar PV inverters and MPPT/Charge Controllers, and battery inverters or integrated hybrid inverters are acceptable. The solution should be integrated with diesel generators and must control the switching on and off the generators. Their design should be based on the requirements specified below:
		<u>Solar inverters/charge controllers with:</u> i. Inclusive of at least 2 maximum power point tracker (MPPT) compatible with the PV modules' layout and total voltage rating, maximizing the PV production. ii. The inverter shall be compatible with the PV module's layout, accounting for possible local temperature variations. iii. Inverter EU efficiency: min 95% (on-grid).
		<u>Battery inverters with:</u> i. Minimum rated output capacity of 8 kW and a maximum peak capacity (for 3 seconds) of at least 10 kW. ii. Three-phase with output voltage of 190V and 60Hz. iii. Compatible with Li-ion battery system. Please note that we expect the battery system to be used daily and therefore the charging and discharging cycle will also happen daily.
3.5.3.3	**General Specifications**	i. Operating Temperature: 0-50°C ii. 3-phase output 190V, 60 Hz. iii. It is preferable to have 3 independent inverters to make the 3-phase output. However, other suitable configurations are also acceptable.
3.5.3.4	**Standards**	Regarding quality assurance, power electronics must follow these certifications, or equivalent ones (if equivalent, specify in the Appendix table, Section 0). Proof of compliance should be presented along with the technical offer, as previously specified. i. Design: **IEC 62093** or equivalent ii. CE-conformity **LVD 2014/35/EC**, including at least the following harmonized standards:

		a. Safety for converters: **EN 62109-1 and EN 62109-2** jointly, or EN 60335-1 (in case of small power electronics), or equivalent iii. Safety for Battery Chargers: EN 60335-2-29 iv. CE-conformity **EMC 2014/30/EU**, including at least the following harmonized standards: a. **EN-IEC 61000-3-3** or **EN-IEC 61000-3-11** b. **EN-IEC 61000-3-2** or **IEC 61000-3-12** v. EMC conformity Emissions limits: Either **EN 61000-6-3, 61000-6-4**, or **EN 55014-1** (according to size of equipment and application) vi. EMC conformity Immunity limits: Either **EN 61000-6-1, 61000-6-2** or **EN 55014-2** (according to size of equipment and application) (if any equivalent standard, specify in the Appendix table, Section 0)
3.5.3.5	**Safety**	i. Provide protection against overload and reverse polarity ii. IP protection class 54 or better
3.5.3.6	**Warranties**	The expected operating lifetime of the battery charge controller and inverter shall be of at least 10 years and the warranty period of 5 years.

3.5.4 Battery

Table 8 - Battery technical requirements

3.5.4.1	**Battery Capacity**	Rated capacity of 80kWh at 1C.
3.5.4.2	**Battery Type**	Lithium-ion batteries.
3.5.4.3	**Features**	The set of batteries in the Hybrid Energy System shall include these technical and performance specifications: i. Number of guaranteed cycles at 80% DOD > 5000 cycles ii. Individual cell monitoring iii. Operating temperature 0-40°C iv. Protection against deep discharge, overcharge v. Charge balancing between cells vi. Batteries should be installed in a climate-controlled environment. Temperature should be kept at optimum operation condition <u>Note:</u> Factory assembles standard modules are preferred above the single units assembles on site.
3.5.4.4	**Standards**	Regarding quality and safety assurance, they must follow these certifications, showing proof of compliance along with the technical offer, as structure previously specified. i. UL 1973 and UN 38.3 (or equivalent).

3.5.4.5	**Labelling**	The bidder shall provide the following information for each battery at the project completion: i. Manufacturer ii. Serial number iii. Number of series and parallels iv. Rated capacity (Ah @1C and @C100) v. Rated voltage vi. Manufacturing date vii. Clear indication of the connecting inlets and outlets viii. Charge strategy ix. Safety warning
3.5.4.6	**Warranty**	The expected lifetime of the battery shall be 10 years, and the warranty period shall be 5 years.
3.5.4.7	**Maintenance**	Maintenance requirements shall be as low as possible.

3.5.5 Technical Room

Table 9 - Technical room requirements

3.5.5.1	**Specifications**	A **Containerized Solution/Cabinet** based on a **weatherproofed container, pre-assembled and tested** in a controlled environment prior shipment, to serve as technical room hosting inverters, charge controllers, battery bank inclusive of intelligent battery charge protection, lighting protection, temperature control, current/voltage fluctuation protection and any other elements that make-up Balance of System (BOS). This solution is to include optimal and controlled environment to enhance the lifespan and functionality of the offered PV components inclusive of appropriate safety features, cooling system, etc. System design should consider and incorporate energy requirements for container internal environment control system and ensure that its specific energy requirements do not reduce requested PV solution capacity. Equipment should be protected with the corresponding IP rating according to where they are installed. It shall remain the bidders' responsibility to guarantee that any civil works or interventions on an existing structure for the power electronics installation (such as drilling in existing wall for inverter fixation, or cabling connections) will not compromise the integrity of the structure. Any damage to the existing structure that may occur as a result of this installation shall be responsibility of the vendor.

3.5.5.2	**Features**	The technical room shall include these features: i. Smoke detection and alarm ii. Fire extinguisher iii. Climate control and protective device iv. Conditions: Warm, Humid Tropical Climate Environments v. Operating Temperature: Desert/Tropical (-10°C/+50°C) vi. Internal temperature shall be regulated for optimal performance of equipment vii. If applicable, concrete base: provide specifications and/or requirements for the cement/concrete base for placement of container. Related civil works to be undertaken by the local office viii. Ensure that the product conforms to appropriate and applicable European, American, Japanese or Australian standards with regards to: Safety for Electrical Appliance, Electrical Standards, Building Standards, Container Internal Environment, General Ventilation and Cooling Standards for such facility, <u>Offer to clearly reflect cost of this element (technical room) including overall system cost improvement and/or increment related to this option.</u>
3.5.5.3	**Branding**	The external color of the container shall be white with the UNDP logo branding on all sides (the detailed design will be provided in vector format after contract award). As per UNDP's policy, no other logos shall be included in the container.

3.5.6 Online monitoring system

Table 10 - Monitoring requirements

3.5.6.1	**Monitoring and Management overview**	Internet connectivity will be available at the site. A local and online monitoring system shall be a user-friendly dashboard that shows **real-time** power consumption, indicating which sources are used to provide the required power (solar PV, battery, grid and/or generator). The monitoring portal shall dispaly the following information in **real-time**: i. Power output of solar PV system (kW). ii. Site electricity consumption - AC loads (kW). iii. Grid status (on/off) and import/export power (kW). iv. Generator status (on/off) and power output (kW). v. Battery state of charge (SOC, %). vi. Battery charge/discharge power (kW). vii. Battery voltage (V). viii. Battery temperature (C°).

		In addition, the monitoring portal should hold the information about ix. List of installed equipment (solar PV system, inverter, charge controller, battery, generator). x. Fault diagnostics xi. Earnings/Savings from the solar PV system in terms of energy (kWh), money ($), and emissions ($kgCO_{2eq}$). The information in the portal shall be presented in English.
3.5.6.2	**Historic monitoring data requirements**	An online monitoring system shall be provided to track the system operation and performance for at least the last 3 years. It must include the following parameters on (at least) an **hourly** basis: i. Solar PV production (kWh). ii. Site electricity consumption - AC loads (kWh). iii. Energy imported from the grid (kWh). iv. Energy exported to the grid (kWh). v. Generator energy production (kWh). vi. Energy charged and discharged from the battery (kWh). vii. Battery state of charge (%). viii. Battery temperature (Co). ix. The monitoring system should also include the configuration and alert records.
3.5.6.3	**Standards**	It is an advantage for the monitoring system to follow the guidelines specified by IEC 61724 -1.

3.5.7 Smart power management

Table 11 - Smart power management requirements

3.5.7.1	**System's operation logic**	The hybrid energy solution shall include Smart Power Management that allows the working system to supply electricity according to the following logic/priorities: 1st: Solar PV 2nd: Electricity grid 3rd: Batteries 4th: Generator

3.5.7.2	**Details**	The Smart Power Management should be able to provide: i. Connection with local building electrical distribution panel. ii. Interconnection with generator. iii. Integration of critical load, and all power sources, excluding the existing PV system and batteries to work as one system, as long as all components are functional. iv. Intelligent monitoring and control of all power sources, including batteries and/or generators, and including auto-start and shutdown of generators. v. Dynamic intelligent management for overall PV system/batteries/grid/generators (energy supply solution). vi. Setup and activation of Internet-based (online) monitoring of Solar PV system for Performance/Availability/Status/etc. vii. Integration of Solar PV + Grid + Generators + Batteries to operate in an integrated, intelligent, and automated manner with regards to energy supply for the Country Office. viii. Protection against power back flow to the generator due to solar production. The generators must be protected from reverse current.
3.5.7.3	**ATS for generator**	Currently the switching between generators is being done manually. As a part of this project, an ATS needs to be installed in order make the switching between diesel generators automatic and controlled by the battery inverters or the system's control logic (SCADA).
3.5.7.4	**Changeover switch**	A changeover switch shall be included to be able to bypass PV.
3.5.7.5	**Power requirements**	The system should not vary the power factor of the load. It shall not vary the reactive power intake form the grid and it shall not increase the peak consumption from the grid.

3.5.8 Wiring and safety

Table 12 - Wiring and safety requirements

3.5.8.1	**Details**	i. Cables needs to be sized according to the required local applicable standards, or otherwise to EU applied standards. Appropriate sizing of cable lengths and dimensions shall respect a maximum of 2% voltage loss at nominal load. ii. Cables installed outdoors must be able to handle high UV radiation, high temperatures, and must be weather resistant. Alternatively, they can be installed in cable trays that ensure they are protected them from the elements. iii. Overcurrent protection for the strings, PV generator, battery and inverter shall be included. iv. Overvoltage surge and lightning protection on the AC and the DC side is required

		v. Protection against electric shock on the AC and DC side is also required vi. Diesel generator shall be protected from back feeding.
3.5.8.2	**Grounding**	i. All components of the system must be properly grounded. ii. All work must be carried in conformance to international and local codes and electricity standards. iii. The devices must be installed in accordance with the grounding device manufacturer's specified instructions.
3.5.8.3	**Firefighter's switch**	Solar arrays shall be equipped with a remotely controlled DC disconnect switch

3.5.9 Warranty of the system

Table 13 - Warranty requirements

3.5.9.1	**Details**	Warranty certification/documentation for the Hybrid Energy System Main Components including summary overview of warranty arrangements (technical and logistical) shall be included in the system documentation. An overview of available warranty extension options for main components shall be provided. Any cost associated with warranty replacements during the warranty period will be borne by the supplier. Any cost associated with the maintenance and technical support for the energy system during maintenance subscription will be borne by the supplier.
3.5.9.2	**Length**	The warranty for the complete system shall be at least 18 months from date of commissioning. This means that, for 18 months after the commissioning, the vendor is responsible for resolving any functionality issues with the complete system, without any financial liability on UNDP.

3.6 Tasks and Responsibilities

The overall tasks and responsibilities of the provider are indicated below in Table 1415.

Table 14 - Mandatory tasks and Responsibilities

3.6.1.1	**Risk Assessment, Avoidance and Mitigation Plan**	A mandatory risk assessment must be conducted and presented along with the technical offer, including as minimum features: i. All potential risks that the project might incur, in each step of the project. ii. The probability of incurrence and severity of the identified risks (e.g.: risk matrix). iii. The risk tolerance for the identified risks. iv. Proactive and reactive responses for risks surpassing the defined threshold of severity and/or probability. v. A mitigation plan for the risks identified as most severe or likely to happen (e.g., in case the final timeline is not respected due to external factors). This risk assessment must include all major phases of the project, i.e., procurement, shipment and transportation of goods, installation of the system, training of the end-users and monitoring of the active system.
3.6.1.2	**Shipment of material**	Shipment if to be provided for all the components of the system, following all procedures and documentation specified in this document. It is recommended to perform check and verification of the good functioning of the System Solution, and all the equipment involved before shipping the container (ideally 2 weeks before shipment). A pre-shipping inspection should be planned in case UNDP chooses to inspect the equipment and products before shipment.
3.6.1.3	**Installation of the Solution**	i. Civil Works and Site Preparation: implementation and/or technical guidance shall be provided by the vendor. ii. The safety of all components remains part of vendor's responsibility during civil works and installation phase, up until commissioning and official hand-over of the system. iii. Earth and lightning protection. iv. All necessary components of the system must be properly grounded v. Anti-theft protection of the whole system. vi. Solar Hybrid Energy System mounting and installation. vii. The engagement and involvement of local or regional partner in order to enhance solar PV system deployment and after-sales services. The installation should follow the guidelines of IEC 63049.
3.6.1.4	**Commissioning, UAT and Training**	**Training** i. Solar Hybrid Energy System training must be provided to UNDP country office representative(s) by vendor.

		ii. The content of the training must also include topics such as: a. Smart use of appliances to avoid misuse of equipment b. Energy efficiency c. Awareness on energy consumption and cost of electricity iii. Solar Hybrid Energy System Essentials (Basics) Maintenance and Troubleshooting Guide must be provided to Country Office in French to ensure level 1 troubleshooting can be carried on by the focal point on-site. **User Acceptance Testing** i. The UAT shall be developed in collaboration with ITM UNDP, following a template and guidelines that will be provided by ITM UNDP further in the process. ii. User Inspection will be performed during commissioning by ITM and the CO Focal point. **Commissioning** i. Complete the UNDP Commissioning check list. ii. As-built diagrams must be provided. iii. If there have been any changes to the technical documentation, the updated documents should also be provided. iv. A representative from the supplier's own staff/team must be present on-site during commissioning of the system.
3.6.1.5	**Stabilization of the System**	i. The awarded vendor must remain at the disposal of the beneficiary for at least six months (stabilization period) after handover/commissioning to assist in answering any technical or other related questions. ii. The maintenance agreement starts after stabilization period of 6 months
3.6.1.6	**Maintenance of the system**	i. Mandatory after-sales services including: a. Maintenance (preventive and corrective) b. Technical support (onsite and/or remote) c. Continuous availability of the online monitoring system ii. Should the vendor wish to engage the involvement of a local or regional partner for the Solar Hybrid Energy System installation, commissioning, and after-sales services, this is possible. iii. Vendor technical support and/or helpdesk contact information and procedures of local including escalation procedures. iv. Solar Hybrid Energy System implementation and after-sales technical support is required, inclusive of appropriate escalation measures. v. Solar Hybrid Energy System maintenance is required, inclusive of appropriate escalation measures. vi. Preventive maintenance shall include: a. Periodic cleaning of the panels in order to guarantee maximum efficiency (minimum twice a year). b. Technical room visual inspection and cleaning.

		c. General system checks and verifications (assessment of the structure status; assessment of the technical room status; cable connections check and securing…). d. Preventive maintenance shall be done in compliance to UNDP's template checklist. vii. Corrective Maintenance shall include: a. System troubleshooting in case of loss of production. b. Parameters adjustment and small changes in operational logic. Maintenance should be performed following the guidelines of IEC 62446-2.

3.7 Timelines

3.7.1 Tasks and deliverables

The overall deliverables and their respective deadline after Purchase Order (PO) signature are indicated below in Table 1516. The tasks are to be performed within the proposed timeline. An overview of the general timeline including all deliverables can be found below this section, in Figure 14..

Table 15 - Tasks and responsibilities timeline

No	Tasks and Deliverables	Deadline
3.7.1.1	**Signature of the contract**	PO
3.7.1.2	**Site Survey Report**	PO + 3 weeks
	Overview site details for a through survey.	
3.7.1.3	**Final Technical Design**	PO + 3-4 weeks
	Single line diagram with endorsement letter from manufacturer	
3.7.1.4	**Pre-assembled technical solution tested and ready to be shipped**	PO + 3 months
3.7.1.5	**Transportation and delivery**	PO + 5 months
3.7.1.6	**Installation of the Solution**	PO + 6 months
	Solar Hybrid Energy System mounting and installation.	
3.7.1.7	**Commissioning, UAT, Training**	PO + 6 months and 1 week
	Complete UNDP Commissioning check list. User Acceptance Testing (UAT). Solar Hybrid Energy System training to UNDP country office representative(s).	
3.7.1.8	**Stabilization of the system**	UAT + 6 months
	The maintenance agreement will start after the stabilization period of six months.	
3.7.1.9	**Maintenance of the system**	UAT + 42 months
	After-sales services including maintenance (preventive and corrective). Technical support (onsite and/or remote) including continues online monitoring.	

3.7.2 Documentation

After award of contract and formalization of purchase order (PO), the supplier shall deliver all the documents listed in Table 1617 by e-mail to UNDP ITM (itm.green.energy@undp.org) and copy UNDP Haiti Procurement Team (procurement.ht@undp.org). An overview of the general timeline including all documentation can be found below this section, in Figure 14.

Table 16 - Documents after award of contract

No	Document	Description	Deadline for delivery
3.7.2.1	**Project Plan Report**	Complete report specifying all the steps that will be carried out to perform the project (from Site Survey to After sales services) with the corresponding timeline and who will be responsible of each step (vendor, local partner or both).	PO + 1 week
3.7.2.2	**Site survey Report**	i. Overview of the sites' details ii. Solar PV Module installation location details (assessment, measurements; photos, etc.). iii. Consideration and assessment for suitable Solar PV Modules mounting system (so it does not compromise the integrity of the roof). iv. Battery bank location details (measurements; photos, etc.). If outdoor, appropriate weatherproof enclosure. v. Technical room information and final proposal, including any necessary civil works to existing structure (ensuring that any necessary interventions such as drilling in existing wall for inverter fixation, or cabling connections will not compromise the integrity of the structure) vi. Diesel Generator location details vii. Electric distribution panel and wiring overview details (grounding, measurements; photos etc.). viii. Assessment and documentation of any shading objects, including photos. ix. Gather current energy consumption profile provided by the client (local grid and/or diesel generator, estimate overview of daily use patterns, appliances, and load profile). x. Assessment and confirmation of the grid quality, along with assessment of phase loads balancing to avoid future integration issues with the PV system. xi. Assessment and confirmation of connectivity availability. xii. Specific civil work requirements	PO + 3 weeks

3.7.2.3	**Design report including system design drawings**	i. Site specific Solar PV Solution inclusive of appropriate sizing and optimization of related components e.g., Solar PV Modules; Batteries; inverter(s) inclusive of surge load capacity. ii. Appropriate sizing of cable lengths and dimensions for maximum 2% voltage loss at nominal load. iii. Energy system components and wiring diagram for proposed solution. (Diagrammatical representation of the technical solution). iv. Offer including Bill of Material (BoM) and technical datasheets for the main components. v. Project delivery plan (including complete summary overview of entire project). vi. Endorsement letter certifying/proving the design from the (inverter and monitoring solution) manufacturer. vii. ISO9001 and ISO14001 certificates for manufacturers of main components (batteries, charge controllers, inverters, and panels), if necessary. viii. Confirmation of the suitability of the solution (considering a detailed assessment of the loads). ix. Draft of checklists/procedures that supplier will follow for UAT and commissioning. Note: The design must be approved by ITM before proceeding.	PO + 3-4 weeks
3.7.2.4	**Bill of materials**	Complete list of materials grouped in assemblies	2 weeks before shipment of materials
3.7.2.5	**Shipping documents**	i. Invoice ii. Packing list iii. Bill of lading iv. Insurance	ASAP after dispatch, minimum 3 weeks before arrival at destination port
3.7.2.6	**Warranty documents**	Warranty certification/documentation for the Solar Hybrid Energy System Main Components, including summary overview of warranty arrangements (technical and logistical). i. Overview of available warranty extension options for main components. ii. Cost associated with warranty replacements during the warranty period will be borne by the supplier.	If not already sent with original offer: After dispatch, minimum 3 weeks before arrival at destination port

		iii. Cost associated with the maintenance and technical support for the installed system during maintenance subscription will be borne by the supplier.	
3.7.2.7	**Testing procedure**	List of tests that will be carried out and respective pass/fail criteria	Latest 4 weeks before testing
3.7.2.8	**Installation and commissioning report**	i. Solar Hybrid Energy System Commissioning Report. ii. Installation and commissioning activities, as-built drawings	Max. 4 weeks after testing
3.7.2.9	**User acceptance testing report and proof of performance to UNDP**	Results of the individual tests and system performance test as outlined in the testing procedure; sign off by vendor, UNDP ITM and system user; any deviations and pending tasks need to be recorded.	1 week after testing
3.7.2.10	**Training manual/guide**	i. On-Site Solar Hybrid Energy System Training Guide. ii. Provide manuals iii. Include training videos	With training
3.7.2.11	**O&M Manual and troubleshooting guide**	i. Solar Hybrid Energy System Maintenance and Troubleshooting Essentials Guide for Country Office (day-to-day operations). ii. Description of correct operation and maintenance of the system. Troubleshooting in case of errors. iii. Preventive and corrective maintenance logs.	With training
3.7.2.12	**O&M schedule**	Schedule of preventive maintenance activities	With training
3.7.2.13	**After sales service agreement**	Agreement between UNDP, vendor, and system user, defining the scope of the included maintenance (corrective and preventive) and technical support (on-site and remote).	With commissioning
3.7.2.14	**Maintenance reports**	Solar Hybrid Energy System Regular Maintenance Technical Report(s).	1 week after maintenance visit
3.7.2.15	**Photo and video documentation**	Documentation of system installation, commissioning, and testing, such as: i. Civil works during installation ii. Training of local staff iii. Overview of installed system iv. Solar panels location	During installation, training, commissioning, and testing

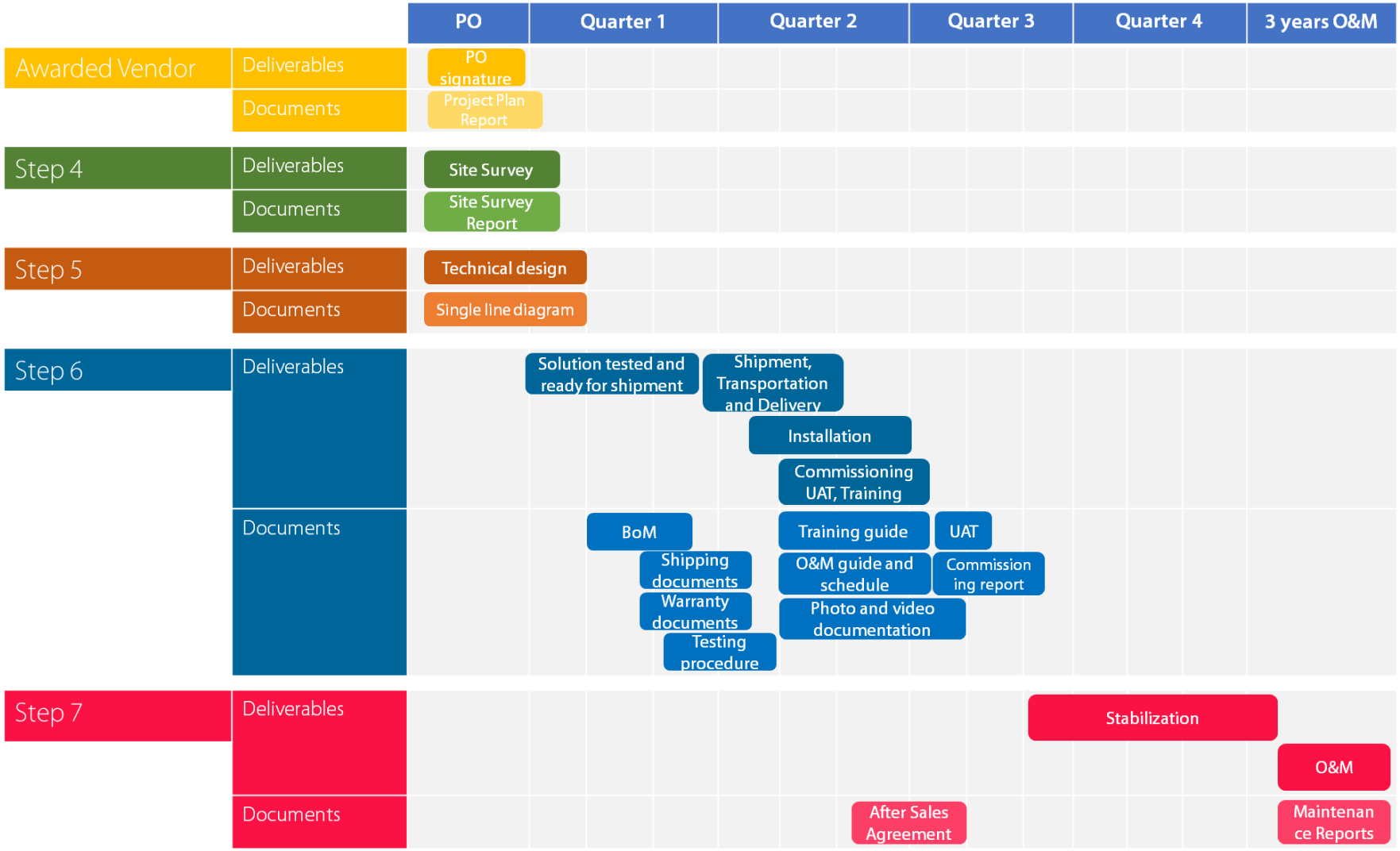

Figure 14 - Documents and Deliverables Timeline

4.0 Communications Management Plan

This section sets the communication framework for the life of the solar PV installation process. The overall desirable outcome is to keep all parties well informed in a timely fashion to avoid disruption and possible misaligned expectations.

	Communication Activity	Description	Frequency	Format/Channel	Deliverable	Responsible	Accountable	Consulted	Informed
1	Publishing RfQ	Final ToR & RfQ	As needed	e-mail	Final RFQ	PSU, GET	PSU	Vendors	CO
2	Site Visit Registration	Submission of list of attendees (including IDs).	As scheduled	e-mail	List of bidders	Vendors	Vendors	CO	PSU, GET
3	Site Visit	Initial visit by bidders	As scheduled	e-mail	List of bidders and list of questions and answers	CO, GET	CO	Vendors	PSU
4	Bidders Conference Registration	Submission of list of attendees	As scheduled	e-mail	List of bidders	Vendors	Vendors	PSU, GET	CO
5	Bidders Conference	Online conference	As scheduled	e-mail, videoconference	Compiled clarification list	PSU, GET	PSU	Vendors	CO
6	Clarifications	Responses & questions	As needed before deadline	e-mail	List of questions and answers	PSU, GET	PSU	CO	Vendors
7	Receipt of bids	Update on progress	Weekly	Meeting	Status update	PSU	PSU	GET	CO
8	Evaluation	Technical & financial	After submission	e-mail	Final assessment results	PSU, GET	GET		CO
9	Winner Announcement	Outcome notification	After evaluation	e-mail	Informational message, PO	PSU	GET	Vendors	CO
10	Installation Plan	GET shares installation plan template to all stakeholders	As needed	SharePoint	Installation Plan	Vendor, CO	Vendor, CO	GET	GET, PSU
11	Kickoff Meeting	Meeting of stakeholders	Once before project start	videoconference	Minutes of the meeting	GET	GET	Vendor, CO	PSU, CO
12	Site survey	Coordination of vendor visit	After project offer	e-mail	Site Survey Report	Vendor	Vendor	CO, GET	PSU
13	Final System Design	Confirmation of detail	As needed	e-mail, phone	Design, letter from manufacturers	Vendor	Vendor	GET	CO, PSU
14	Shipping	Shipment of goods	As per provided timeline	e-mail	Invoice, Packing list, Bill of lading, Insurance	Vendor	Vendor	CO, GET	CO, GET
15	Customs clearance	Clearance of good at the CO	As needed	In person, e-mail	Clearance confirmation	CO	CO	Vendor	GET
16	Installation	General	As needed	e-mail, phone	General questions and change requests	Vendor, GET	Vendor	CO	PSU
17	Onsite Assessment	Assessment of all aspects of project	End of each installation	e-mail, In person		GET, Vendor	GET	Vendor	CO, PSU
18	Invoice Payment	Receipting and disbursement	As per agreed plan	e-mail, phone	Invoice, payment confirmation	GET	GET	Vendor	PSU, CO
20	Commissioning	Schedule for training, UAT, etc.	End of each installation	e-mail	Signed UAT, checklist, etc.	Vendor, GET	Vendor	CO	PSU
21	System Inauguration					CO, GET	CO	-	-
22	System Maintenance	Bi-annual and general support	As needed	e-mail, phone	Maintenance report	GET, Vendor	Vendor	CO	-

Installation phase: - Please note that during the installation phase, it is requested that all stakeholders are included in all email exchanges. The GET provides assistance in the general project management, nevertheless direct communication between the Vendor and the CO is advised. In case of delayed response time or in case of arisen problems, GET will step in to enhance communication flow.

4.1 Project Team Contact Details

Name	Designation	E-mail	Phone #
ITM GET (GET)	Project Manager	itm.green.energy@undp.org	+45 45 33 61 14
CO Procurement	Contract Manager	procurement.ht@undp.org	+59 28 14 02 60
<<Vendor name>> (Vendor)	Solution provider	Vendor's email TBA	TBA

4.2 Communications Conduct:

Meetings: - Ad-hoc project meetings will be convened whenever there is need for in-depth discussions that cannot be achieved through e-mail or telephone communication. A record of the meeting proceedings will be kept, particularly action points and agreed decisions.

Email: - E-mail communication is considered an official record in UNDP, and this applies for solar PV installation projects as well. Most issues and information with clear cut intents will be communicated through e-mail to the relevant parties. To keep all informed and for audit trail purposes, all parties should be copied as suitable, and the same thread used as much as possible. All circumstances that may impact on delivery timelines should be proactively communicated by the concerned party to allow for timely resolution.

Informal Communications: - For successful and timely project implement, informal communication is a necessary ingredient especially in solar PV projects. Given the nature of the projects, interaction between the parties, informal communication will form a sizable chunk of overall communication in this project. However, caution needs to be exercised to avoid negative consequences at a later stage. All communication that commits either part/stakeholder should be formally documented and communicated accordingly.

Appendix I: Compliance Response Form		**Understood**	**Understood with reservations**	**Comments**	
6.1 Introduction					
1	**Introduction**	☐	☐		
0	**Sustainable Development Goals**	☐	☐		
0	**Smart UN Facilities**	☐	☐		
0	**7-Step Green Energy Process**	☐	☐		
6.2 Project Description					
2	**Project Description**	☐	☐		
0	**Project Objectives**	☐	☐		
0	**Project High Level Requirements**	☐	☐		
0	**Description of Site**	☐	☐		
Error! Reference source not found.	**Weather on Site**	☐	☐		
0	**Potential Location of PV Panels**	☐	☐		
0	**Estimated Load Consumption**	☐	☐		
0	**Connectivity**	☐	☐		
0	**Generator**	☐	☐		
0	**Grid Quality**	☐	☐		
0	**Local Partner**	☐	☐		
0	**After-sales services and response time**	☐	☐		
0	**Site Visit**	☐	☐		
0	**Bidders Conference**	☐	☐		
6.3 Technical Requirements		**Compliant**	**Deviations**	**Comments**	**Reference**
0 3.5.1 PV Modules					
0	**PV Capacity**	☐	☐		
0	**Module Specifications**	☐	☐		
0	**Standards**	☐	☐		
0	**Module Efficiency**	☐	☐		
0	**Limited Power Warranty**	☐	☐		
0	**Voltage rating**	☐	☐		
0	**Disconnecting means**	☐	☐		
0	**Tilt**	☐	☐		

0	**Labelling**	☐	☐		
0 3.5.2 PV Modules mounting					
0	**Features**	☐	☐		
0	**Mounting Structure**	☐	☐		
0	**Lifespan**	☐	☐		
0	**Standards**	☐	☐		
0 3.5.3 Power electronics		**Compliant**	**Deviations**	**Comments**	**Reference**
0	**Features**	☐	☐		
0	**Inverter Specifications**	☐	☐		
0	**General Specifications**	☐	☐		
0	**Standards**	☐	☐		
0	**Safety**	☐	☐		
0	**Warranties**	☐	☐		
0 3.5.4 Battery					
0	**Battery Capacity**	☐	☐		
0	**Battery Type**	☐	☐		
0	**Features**	☐	☐		
0	**Standards**	☐	☐		
0	**Labelling**	☐	☐		
0	**Warranty Maintenance**	☐	☐		
0	**Warranty**	☐	☐		
0 3.5.5 Technical Room					
0	**Specifications**	☐	☐		
0	**Features**	☐	☐		
0	**Branding**	☐	☐		
0 3.5.6 Online monitoring system					
0	**Monitoring and Management Overview**	☐	☐		
0	**List of hourly basis parameters**	☐	☐		
0	**Standards**	☐	☐		
0 3.5.76 Smart power management					
0	**System's operation logic**	☐	☐		
0	**Details**	☐	☐		
0	**Changeover Switch**	☐	☐		
0	**Reactive power requirements**	☐	☐		

0 3.5.87 Wiring and safety					
0	**Details**	☐	☐		
0	**Grounding**	☐	☐		
0	**Firefighter's switch**	☐	☐		
0 3.5.98 Warranty of the system					
0	**Details**	☐	☐		
3.5.9.2	**Length**	☐	☐		
0 3.6 Tasks and Responsibilities		**Compliant**	**Deviations**	**Comments**	**Reference**
0	**Risk Assessment, Avoidance and Mitigation Plan**	☐	☐		
0	**Shipment of material**	☐	☐		
0	**Installation of the Solution**	☐	☐		
0	**Commissioning, UAT and Training**	☐	☐		
0	**Stabilization of the System**	☐	☐		
0	**Maintenance of the system**	☐	☐		
0 Timelines and Deliverables					
0	**Signature of the contract**	☐	☐		
0	**Site Survey**	☐	☐		
0	**Final Technical Design**	☐	☐		
0	**Pre-assembled technical solution tested and ready to be shipped**	☐	☐		
0	**Transportation**	☐	☐		
0	**Installation of the Solution**	☐	☐		
0	**Commissioning, UAT, Training**	☐	☐		
0	**Stabilization of the system**	☐	☐		
0	**Maintenance of the system**	☐	☐		
0 Documentation					
0	**Project Plan Report**	☐	☐		
0	**Site survey Report**	☐	☐		
0	**Design report including system design drawings**	☐	☐		
0	**Bill of materials**	☐	☐		
0	**Shipping documents**	☐	☐		
0	**Warranty documents**	☐	☐		
0	**Testing procedure**	☐	☐		
0	**Installation and commissioning report**	☐	☐		

0	**User acceptance testing report and proof of performance to UNDP**	☐	☐		
0	**Training manual/guide**	☐	☐		
0	**O&M Manual and troubleshooting guide**	☐	☐		
0	**O&M schedule**	☐	☐		
0	**After sales service agreement including maintenance (corrective and preventive) and technical support (on-site and remote)**	☐	☐		
0	**Maintenance reports**	☐	☐		
0	**Photo and video documentation**	☐	☐		

Who we are
UNDP ITM/SIS

Our Vision

Creating Smart Facilities to build local capacity and inspire a movement.

Our Mission

To support and guide Country Offices in leveraging technology for efficient delivery on the organization's mandate.

The Information and Technology Management unit is the leader in digital transformation, so UNDP can be agile and effective in its global delivery.

UNDP ITM is headquartered in New York and UN City Copenhagen Denmark, a smart facility which hosts 9 UN agencies and is built with a high focus on sustainability. Our combined efforts provide standardized practices for UNDP country offices to achieve the Sustainable Development Goals and incite other local and international entities to follow our lead.

To illustrate our work, in the wake of the 2014 West Africa Ebola outbreak, country offices in Guinea, Sierra Leone and Liberia could not rely on the grid to meet their energy requirements and diesel shortages restricted access to a sufficient power supply. In order to address this, UNDP ITM leveraged its experience in implementing smart facilities to roll out solar solutions in the affected countries.

Following this outbreak, UNDP ITM has aided the installation of solar panel systems in over 13 countries worldwide.

We look forward to implementing the Smart Facilities concept even further.

United Nations Development Programme
Information & Technology Management
Smart Infrastructure Services

UN City
Marmovej 51,
2100 Copenhagen
Denmark

www.undp.org

Annex 2: Form for Submitting Supplier's Quotation

(This Form must be submitted only using the Supplier's Official Letterhead/Stationery)

We, the undersigned, hereby accept in full the UNDP General Terms and Conditions, and hereby offer to supply the items listed below in conformity with the specification and requirements of UNDP as per RFQ Reference No. _____:

Offer to Supply Goods Compliant with Technical Specifications and Requirements

Please provide the following requirements for single standard solutions. Kindly note that is expected from the bidders to make an offer for all the items.

Currency of the Quotation: Haitian Gourde – HTG (mandatory for Local Bidders) or USD.

Table 17 - Price Schedule

Category	Item	Description	Quantity	Unit Price	Total Price
1. Solar Panels	**1.1**	Solar Panels for 15 kWp			
	1.2	Design, Sizing and Documentation			
	1.3	Site Preparation and Civil Works			
	1.4	Mounting Structure			
	1.5	Installation, Initial PV System Training, UAT and Commissioning			
	1.6	Integration with existing local office electric distribution and wiring.			
	1.7	Freight DPU cost to Port-au-Prince, Haiti			
2. Power Electronics	**2.1**	Hybrid Inverters and Smart Power Management Unit/Assembly			
	2.2	Solar Charge Controller			
	2.3	Technical room/container/technical cabinet			
	2.4	Lightning and Surge Protection			
	2.5	Ancillaries and cables			
3. Battery	**3.1**	80 kWh Lithium-Ion Battery Solution			
		TOTAL FINAL ACQUISITION COST (sum of above items)			
4 Maintenance and Extra items	**4.1**	**Maintenance Cost** Biannual maintenance by the local partner (annual cost, lasting for 3 years): after-sales services including maintenance (preventative and corrective) and technical support (on-site and/or remote) including continues online system and performance monitoring.	**3 years**		
5.1		**TOTAL FINAL DPU COST**			

All other information that we have not provided automatically implies our full compliance with the requirements, terms and conditions of the RFQ.

[Name and Signature of the Supplier's Authorized Person]
[Designation]
[Date]

Annex 3: General Terms and Conditions

1. ACCEPTANCE OF THE PURCHASE ORDER

This Purchase Order may only be accepted by the Supplier's signing and returning an acknowledgement copy of it or by timely delivery of the goods in accordance with the terms of this Purchase Order, as herein specified. Acceptance of this Purchase Order shall effect a contract between the Parties under which the rights and obligations of the Parties shall be governed solely by the terms and conditions of this Purchase Order, including these General Conditions. No additional or inconsistent provisions proposed by the Supplier shall bind UNDP unless agreed to in writing by a duly authorized official of UNDP.

2. PAYMENT

1. UNDP shall, on fulfillment of the Delivery Terms, unless otherwise provided in this Purchase Order, make payment within 30 days of receipt of the Supplier's invoice for the goods and copies of the shipping documents specified in this Purchase Order.
2. Payment against the invoice referred to above will reflect any discount shown under the payment terms of this Purchase Order, provided payment is made within the period required by such payment terms.
3. Unless authorized by UNDP, the Supplier shall submit one invoice in respect of this Purchase Order, and such invoice must indicate the Purchase Order's identification number.
4. The prices shown in this Purchase Order may not be increased except by express written agreement of UNDP.

3. TAX EXEMPTION

3.1 Section 7 of the Convention on the Privileges and Immunities of the United Nations provides, inter alia, that the United Nations, including its subsidiary organs, is exempt from all direct taxes, except charges for utilities services, and is exempt from customs duties and charges of a similar nature in respect of articles imported or exported for its official use. In the event any governmental authority refuses to recognize UNDP's exemption from such taxes, duties or charges, the Supplier shall immediately consult with UNDP to determine a mutually acceptable procedure.

3.2 Accordingly, the Supplier authorizes UNDP to deduct from the Supplier's invoice any amount representing such taxes, duties or charges, unless the Supplier has consulted with UNDP before the payment thereof and UNDP has, in each instance, specifically authorized the Supplier to pay such taxes, duties or charges under protest. In that event, the Supplier shall provide UNDP with written evidence that payment of such taxes, duties or charges has been made and appropriately authorized.

4. RISK OF LOSS

Risk of loss, damage to or destruction of the goods shall be governed in accordance with Incoterms 2010, unless otherwise agreed upon by the Parties on the front side of this Purchase Order.

5. EXPORT LICENCES

Notwithstanding any INCOTERM 2010 used in this Purchase Order, the Supplier shall obtain any export licences required for the goods.

6. FITNESS OF GOODS/PACKAGING

The Supplier warrants that the goods, including packaging, conform to the specifications for the goods ordered under this Purchase Order and are fit for the purposes for which such goods are ordinarily used and for purposes expressly made known to the Supplier by UNDP, and are free from defects in workmanship and materials. The Supplier also warrants that the goods are contained or packaged adequately to protect the goods.

7. INSPECTION

7.1 UNDP shall have a reasonable time after delivery of the goods to inspect them and to reject and refuse acceptance of goods not conforming to this Purchase Order; payment for goods pursuant to this Purchase Order shall not be deemed an acceptance of the goods.

7.2 Inspection prior to shipment does not relieve the Supplier from any of its contractual obligations.

8. INTELLECTUAL PROPERTY INFRINGEMENT

The Supplier warrants that the use or supply by UNDP of the goods sold under this Purchase Order does not infringe any patent, design, trade-name or trade-mark. In addition, the Supplier shall, pursuant to this warranty, indemnify, defend and hold UNDP and the United Nations harmless from any actions or claims brought against UNDP or the United Nations pertaining to the alleged infringement of a patent, design, trade-name or trade-mark arising in connection with the goods sold under this Purchase Order.

9. RIGHTS OF UNDP

In case of failure by the Supplier to fulfil its obligations under the terms and conditions of this Purchase Order, including but not limited to failure to obtain necessary export licences, or to make delivery of all or part of the goods by the agreed delivery date or dates, UNDP may, after giving the Supplier reasonable notice to perform and without prejudice to any other rights or remedies, exercise one or more of the following rights:

1. Procure all or part of the goods from other sources, in which event UNDP may hold the Supplier responsible for any excess cost occasioned thereby.
2. Refuse to accept delivery of all or part of the goods.
3. Cancel this Purchase Order without any liability for termination charges or any other liability of any kind of UNDP.

10. LATE DELIVERY

Without limiting any other rights or obligations of the parties hereunder, if the Supplier will be unable to deliver the goods by the delivery date(s) stipulated in this Purchase Order, the Supplier shall (i) immediately consult with UNDP to determine the most expeditious means for delivering the goods and (ii) use an expedited means of delivery, at the Supplier's cost (unless the delay is due to Force Majeure), if reasonably so requested by UNDP.

11. ASSIGNMENT AND INSOLVENCY

1. The Supplier shall not, except after obtaining the written consent of UNDP, assign, transfer, pledge or make other disposition of this Purchase Order, or any part thereof, or any of the Supplier's rights or obligations under this Purchase Order.

2. Should the Supplier become insolvent or should control of the Supplier change by virtue of insolvency, UNDP may, without prejudice to any other rights or remedies, immediately terminate this Purchase Order by giving the Supplier written notice of termination.

12. USE OF UNDP OR UNITED NATIONS NAME OR EMBLEM

The Supplier shall not use the name, emblem or official seal of UNDP or the United Nations for any purpose.

13. PROHIBITION ON ADVERTISING

The Supplier shall not advertise or otherwise make public that it is furnishing goods or services to UNDP without specific permission of UNDP in each instance.

14. CHILD LABOUR

The Supplier represents and warrants that neither it nor any of its affiliates is engaged in any practice inconsistent with the rights set forth in the Convention on the Rights of the Child, including Article 32 thereof, which, inter alia, requires that a child shall be protected from performing any work that is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral or social development.

Any breach of this representation and warranty shall entitle UNDP to terminate this Purchase Order immediately upon notice to the Supplier, without any liability for termination charges or any other liability of any kind of UNDP.

15. MINES

The Supplier represents and warrants that neither it nor any of its affiliates is actively and directly engaged in patent activities, development, assembly, production, trade or manufacture of mines or in such activities in respect of components primarily utilized in the manufacture of Mines. The term "Mines" means those devices defined in Article 2, Paragraphs 1, 4 and 5 of Protocol II annexed to the Convention on Prohibitions and Restrictions on the Use of Certain Conventional Weapons Which May Be Deemed to Be Excessively Injurious or to Have Indiscriminate Effects of 1980.

Any breach of this representation and warranty shall entitle UNDP to terminate this Purchase Order immediately upon notice to the Supplier, without any liability for termination charges or any other liability of any kind of UNDP.

16. SETTLEMENT OF DISPUTES

16.1 Amicable Settlement. The Parties shall use their best efforts to settle amicably any dispute, controversy or claim arising out of, or relating to this Purchase Order or the breach, termination or invalidity thereof. Where the Parties wish to seek such an amicable settlement through conciliation, the conciliation shall take place in accordance with the UNCITRAL Conciliation Rules then obtaining, or according to such other procedure as may be agreed between the Parties.

16.2 Arbitration. Unless, any such dispute, controversy or claim between the Parties arising out of or relating to this Purchase Order or the breach, termination or invalidity thereof is settled

amicably under the preceding paragraph of this Section within sixty (60) days after receipt by one Party of the other Party's request for such amicable settlement, such dispute, controversy or claim shall be referred by either Party to arbitration in accordance with the UNCITRAL Arbitration Rules then obtaining, including its provisions on applicable law. The arbitral tribunal shall have no authority to award punitive damages. The Parties shall be bound by any arbitration award rendered as a result of such arbitration as the final adjudication of any such controversy, claim or dispute.

17. PRIVILEGES AND IMMUNITIES

Nothing in or related to these General Terms and Conditions or this Purchase Order shall be deemed a waiver of any of the privileges and immunities of the United Nations, including its subsidiary organs.

18. SEXUAL EXPLOITATION:

18.1 The Contractor shall take all appropriate measures to prevent sexual exploitation or abuse of anyone by it or by any of its employees or any other persons who may be engaged by the Contractor to perform any services under the Contract. For these purposes, sexual activity with any person less than eighteen years of age, regardless of any laws relating to consent, shall constitute the sexual exploitation and abuse of such person. In addition, the Contractor shall refrain from, and shall take all appropriate measures to prohibit its employees or other persons engaged by it from, exchanging any money, goods, services, offers of employment or other things of value, for sexual favors or activities, or from engaging in any sexual activities that are exploitive or degrading to any person. The Contractor acknowledges and agrees that the provisions hereof constitute an essential term of the Contract and that any breach of this representation and warranty shall entitle UNDP to terminate the Contract immediately upon notice to the Contractor, without any liability for termination charges or any other liability of any kind.

18.2 UNDP shall not apply the foregoing standard relating to age in any case in which the Contractor's personnel or any other person who may be engaged by the Contractor to perform any services under the Contract is married to the person less than the age of eighteen years with whom sexual activity has occurred and in which such marriage is recognized as valid under the laws of the country of citizenship of such Contractor's personnel or such other person who may be engaged by the Contractor to perform any services under the Contract.

19. OFFICIALS NOT TO BENEFIT:

The Contractor warrants that no official of UNDP or the United Nations has received or will be offered by the Contractor any direct or indirect benefit arising from this Contract or the award thereof. The Contractor agrees that breach of this provision is a breach of an essential term of this Contract.

20. AUTHORITY TO MODIFY:

Pursuant to the Financial Regulations and Rules of UNDP, only the UNDP Authorized Official possess the authority to agree on behalf of UNDP to any modification of or change in this Agreement, to a waiver of any of its provisions or to any additional contractual relationship of any kind with the Contractor. Accordingly, no modification or change in this Contract shall be valid and enforceable against UNDP unless provided by an amendment to this Agreement signed by the Contractor and jointly by the UNDP Authorized Official.