



**RURAL ELECTRIFICATION AGENCY**  
ENERGY – EMPOWERMENT – EFFICIENCY  
**NIGERIA ELECTRIFICATION PROJECT (NEP)**



**THE WORLD BANK**

## **NIGERIA ELECTRIFICATION PROJECT**

### **TERMS OF REFERENCE**

**FOR**

**CONSULTANCY SERVICES FOR PROJECT OWNER'S ENGINEER (POE) FOR THE  
SUPERVISION OF THE PROVISION OF SOLAR HYBRID MINI-GRID TO 400 PRIMARY  
HEALTHCARE FACILITIES AND THEIR HOST COMMUNITIES**

**REA-NEP/C/QCBS/142/2022**

**November 2022**

## **Introduction**

The Federal Government of Nigeria has applied for financing from the International Development Association for a Credit towards the cost of Nigeria Electrification Project (NEP) and Rural Electrification Agency, the implementation Agency intends to apply part towards providing sustainable, efficient power supply to Primary Healthcare Centres, hospitals and Isolation Centers in order to respond to the current ongoing Covid-19 Pandemic. Covid-19 presents unique and severe challenges to health care systems. It is an exponentially increasing pandemic, so time is severely limited before many are infected and healthcare facilities become overrun with patients.

It is highly contagious, with each infected person infecting around 3 other people, and asymptomatic people can infect others. Approximately 20 percent of people infected with the virus will require medical care (to receive oxygen and other treatments to mitigate symptoms), and 20 percent of these patients will require intensive care, typically mechanically assisted breathing. Patients who require medical intervention typically remain in the hospital or clinic for around 2 weeks.

More than 80% of all the health facilities do not have access to sustainable electricity supply, 62% of health facilities have no access to electricity. Most of these health facilities require reliable power supply for effective operations and emergency response. Therefore, there is an urgent need for an intervention towards providing electricity access to these health facilities within the shortest possible time frame in order to adequately deal with the potential outbreak of the virus and other medical challenges especially in the Rural Communities.

As a result, the COVID-19 and Beyond program, which aims to provide sustainable and clean power to COVID-19 Isolation and Treatment Centres (ITCs), as well as Primary Healthcare Centres (PHCs) was initiated. The program is to be implemented in 2 phases, namely the development of solar hybrid power supply to 100 isolation and treatment centers and the provision of solar hybrid mini-grid to 400 PHCs and their host communities. In order to ensure smooth, timely and effective implementation of electrifying the 400 PHCs and their host communities, in conformation with good industry best practices, the REA is seeking the services of a qualified Project Owner's Engineering (POE) firm or consortium of firms, for the consultancy services, for the supervision and monitoring activities of the supply, installation and commissioning of the project.

## **Objectives**

The objective of the POE consulting services shall be to ensure that the Project is implemented with a high standard of workmanship and quality in accordance with engineering best practice standards as given by IEC & IEEE, on schedule, and within the budget, in accordance with the specifications and drawings of the contract, to acceptable environmental and social standards and in accordance with the REA's requirements and the World Bank's Safeguard Policies

## **Scope of Work**

The objectives of the services will be achieved through the following major activities:

1. Review the load profiles, system sizing and financial models of the selected 400 sites
2. Review designs and support in evaluating the bids/proposals
3. Provide a comprehensive review and expert inputs on the execution plan put together by the REA team; take ownership of its regular update as part of the monthly progress reporting under the overall Owner's Engineer activities
4. Provide support in the review of equipment drawings as they are received to ensure that they meet the requirements and the specifications
5. Put in place a Management Dashboard (potentially with the use of the Odyssey platform) that will enable the REA to carry out rapid status checks on the status of deployment, installation and O&M of the various systems at their respective sites
6. Review designs, drawings of the equipment, the supply and installation schedules, layouts, as well as programs of works submitted by the mini-grid developers (suppliers) and approve or amend them as appropriate in consultation with the REA
7. Review and confirm quality assurance program of the suppliers
8. Monitor and supervise on site testing of the all the major equipment to ensure that they meet the requirement and specifications under the contract in consultation with the REA-NEP (and whenever feasible in the presence of the REA-NEP staff)
9. The list of equipment to be inspected are as follows but not limited to:
  - I. PV modules & module support structures (MMS)
  - II. Inverters (PV inverters & Battery Inverters).
  - III. Energy Storage System (ESS)
  - IV. Control Systems and Switch gears
  - V. Diesel generators and fuel storage infrastructure associated with the system
  - VI. Distribution infrastructure

10. Supervise and monitor the delivery of equipment to ensure smooth and timely completion of the works. Also, verification of proper installation should be conducted in-person but can be done remotely if in-person verification is not possible at the time of verification, with in-person verification occurring as soon as possible thereafter. Deployment of the systems will be tracked through the Odyssey online platform
11. Review and approve supplier's work plans/programs including adhering to safety procedures for all stakeholders, including changes during implementation.
12. Check, set out, and provide base line surveys with benchmarks for the service providers to establish their survey control for construction
13. Monitor site activities for delivery and installation activities with respect to the latest approved plans/schedules and supervise the testing and commissioning of all equipment
14. Hold regular meetings with the service providers to review project progress, technical issues, and measures to achieve the targeted cost, quality and schedule controls.
15. Manage safety, social, and environmental related issues during the construction in cooperation with the REA
16. Conduct measurement and verification of work quantities and certification of the service provider's request for payment approval and also recommend release of payments
17. Issue stop orders of work with prior approval of the REA
18. Perform tests on materials as and, when required, to ensure satisfactory suitability of materials for use in the works at the field laboratory established by the service provider
19. Monitor the service providers' progress of work
20. Prepare, process and issue variation orders, if any, subject to REA Management approval
21. Make recommendations to the REA regarding settlement of claims by the service providers
22. Prepare a "Completion Report" for the works under the contract, including a summary of final costs, and supply 3 copies of the same to the REA for future reference.

23. Conduct regular site inspections with REA-NEP mini-grid engineers to PBG sites that are ready for commissioning
24. Conduct regular site inspections with REA-NEP mini-grid engineers to MST sites that are ready for commissioning
25. Review and approve the operation and maintenance manuals provided by the supplier
26. Review and approve commissioning procedures and Operation & Maintenance manuals prepared and submitted by the service provider.
27. Witness checks and record all commissioning and performance tests, including Supervision of the commissioning of all the solar power plants.
28. Review and approve as built drawing of the solar power plants
  
29. Prepare all contract closing out documentation and prepare contract final account.
30. Issue taking over final certificate and hand over the solar plant to Client.
31. Prepare strategy for defects liability period of 3 months: This includes supplier's responsibility for rectification of any defects, compilation of snag list of works during the defects liability period. For the defects liability period, the consultant is advised to provide for minimum level of personnel, to be agreed during contract negotiations. These personnel are expected to be in attendance by making routine visits and as exigencies at sites demand during the defects liability period.
32. The Consultant will also undertake any other duty or assignment that will ensure the successful implementation of the project in line with the Contract Agreement, Specifications, International Quality and Environmental Best Practices.

**Project Management:**

**Contract Procedures:**

The Consultant shall formulate and establish procedures for the proper management, administration and quality assurance of all contracts for the construction of the projects as well as the Consultant's own services, and shall carry out monitoring and control of these procedures

## **Reports**

The Consultant shall check and approve the following reports, which shall be in a format agreed with the REA and which shall be submitted in number of copies to be agreed with the REA:

- I. Monthly progress report, which will incorporate submission of the following documents:
  - a. Cumulative expenditure record and estimated cost at completion of each item
  - b. Claims received, under consideration and settled
  - c. Detailed description of works carried-out and challenges experienced, including remedial actions during the reporting period
- II. Quarterly project progress monitoring reports (summary reports on instrumentation monitoring or similar construction performance system) and quarterly financial monitoring reports
- III. Technical reports on instrumentation monitoring or similar construction performance
- IV. Completion Reports for all major structures or elements of the contract works incorporating as-built records and drawings
- V. Any special reports as requested by the REA.

## **Programme Management:**

- Within 7 days of award of the Consulting contract, the Consultant shall prepare, and submit to the REA for consent, a detailed program of all of the activities related to the execution of the project. The Consultant's program shall be based on the reviewed and accepted programs of the Civil and Electrical Works and shall include all activities that interface or otherwise relate to the work being done by the developers.
- Submission of program data shall include as a minimum:
  - Tabular listings giving:
    - ✓ Early starts and finishes of works
    - ✓ Late starts and finishes of works
    - ✓ Information on assumed shutdown periods; and
    - ✓ Vacation days, and other non-working time periods.
- When this program has been approved by the REA, it shall become the new baseline program for monitoring the execution of the Project (the progress monitoring with milestones) and shall not be modified or revised by the Consultant without the prior consent of the REA
- If an update of the project program is required, a revised program shall be prepared by the service provider and reviewed by the Consultant and resubmitted to the REA for its consent. When approved, this program will become the new baseline program for all future work.

**Project relations:**

The Consultant shall promote good project relations and in so doing shall monitor project labour relations, living conditions, health and safety programs, and community relations to identify potential problems and resolve them promptly. Problems that cannot be resolved promptly by the Consultant through the construction and equipment contracts shall be reported forthwith to the REA for action at the earliest possible.

**Commissioning of works:**

The Consultant shall be responsible for supervising the commissioning of all structures and systems on the project sites. The Consultant shall prepare commissioning procedures, involving the REA's operating staff, coordinate testing and commissioning programs. During construction, the Consultant shall make himself fully aware of the state of all structures and plant of the civil works, and ensure that the service providers or unauthorized personnel do not use or operate the structures and systems prior to or after commissioning except as authorized by the Consultant.

**Review of Operation and Maintenance manuals provided by the service provider:**

The Consultant shall review and finalize the detailed O&M manuals for the complete systems and all subsystems provided by the service providers under the construction and equipment contracts. The Consultant shall liaise with the REA and the service providers to ensure that uniform, complete, high-quality O&M manuals are prepared for the sites.

**Qualifications of the Firm**

The firm must be a certified consulting firm that has been established for no less than 5 years prior to the date of the EOI. The Consulting firm sought for this assignment must be an Engineering firm with a minimum of one (1) year of continuous experience serving as an Owner's Engineer in solar hybrid power plants in Nigeria or other similar developing countries. The selected firm will be expected to have experience in the design and supervision of construction of solar-hybrid projects, including power stations, civil structures, and other appurtenant works. Emphasis is placed on the need for relevant design and construction supervision engineers to have knowledge and previous experience of similar works to those at the project sites. It is particularly important that the engineers shall have substantial previous experience in dealing with contractual matters and contract claims.

The firms will assign adequately qualified key personnel to carry out the Consulting Services. In particular, the key personnel should possess the qualification and experience as indicated in the table below. The estimated man-month for the assignment is also shown in the table below.

<b>S/N</b>	<b>PERSONNEL</b>	<b>REQUIRED QUALIFICATION &amp; EXPERIENCE</b>	<b>MAN /MONTH</b>
<b>Owner's Engineer</b>			
1	Project Manager	Bachelor's Degree in Engineering or other related fields with 10 years general experience and 5 years' experience in project management for solar power plants.	x1/12 (Full time)
2	Senior Electrical Engineer	Bachelor's Degree in Engineering, preferably electrical, with 10 years of general experience and over 3 years of experience in solar power construction projects.	6/12(Full time)
3	Lead, Review Team (Solar)	Bachelor's Degree in Electrical Engineering with 4 years of general experience and over 2 years of experience in solar power construction projects.	2/6
4	Lead, Review Team (Civil)	Bachelor's Degree in Civil Engineering with 4 years post qualification experience in Foundations, Structures and at least 2 years of experience in solar power projects.	2/6
5	Financial Expert	Bachelor's Degree in Accounting with 5 years post qualification experience in Project Management Accounting, and at least 2 years of experience in solar power projects.	2/ 6
6	Lead, Review Team (Electrical)	Bachelor's Degree in Electrical Engineering with 2 years post qualification experience in solar power construction projects.	2/ 6
7	Safeguard Specialist (Health, Safety & Environment)	Bachelor's Degree in Sciences & Social Sciences or equivalent with 2 years of post-qualification experience in HSE with at least 3 years of experience in solar power projects.	6/3
8	Gender Based Violence (GBV) officer	Bachelor's Degree in Social Work or other Social Sciences with knowledge of gender issues in development, particularly GBV, with 3 years of post-qualification experience in	6/6



		GBV and least 1 year of experience in solar power projects.	
9	Lead, Legal	Law Graduate with at least five (5) years of Professional Practice experience in the relevant field and also having license of Nigerian Law School or its equivalent. Must be a registered member of a legal professional body in the country or its equivalent	1/6
	NON-KEY STAFF		
1	Resident Engineers (Construction Installation & Commissioning)	Bachelor's Degree in Engineering, preferably electrical, with 6 years of general experience and over 3 years of experience in solar power construction projects.	37/ 6(on-site)
2	Document Control Officer	Bachelor's degree in any discipline, with proficiency in Microsoft Office Applications and experience in document management as well as document drafting (minutes etc.)	4/9

In order to maintain close liaison between project management, design, and construction supervision teams, the REA requires that the Consultant, contract management, construction supervision, and design staff members all be located on the REA selected project sites or at the minimum in each of the six (6) geo-political zones in Nigeria.

### STAFF INPUTS

The proposed estimated staff inputs are as follows:

S/N	STAFF	NO	TIME INPUTS (MAN-MONTH)	TOTAL MAN-MONTHS
<b>KEY EXPERTS</b>				
1.	Project Manager	1	12	12
2.	Senior Electrical Engineers	6	12	72
3.	Lead, Review Team (Solar)	2	6	12
4.	Lead, Review Team (Civil)	2	6	12
5.	Financial Expert	2	6	12
6.	Lead, Review Team (Electrical)	2	6	12

7	Safeguard Specialist (Health, Safety & Environment)	6	3	18
8.	Gender Based Violence (GBV) officer	6	6	36
9.	Lead, Legal	1	6	6
<b>NON-KEY STAFF</b>				
1	Resident Engineers (Construction Installation & Commissioning)	37	6	222
2	Document Control Officer	4	9	36
<b>Total (Man-Months)</b>				<b>450</b>

### Deliverables

In the course of the service, the consultant is required to provide reports as listed below, covering various contracts and activities at the project site:

**Inception Report** This should include the revised methodology and work plan with clearly defined strategy for carrying out the assignment with timelines for the various outputs. The report should indicate the objective, scope and the implementation approach that re-confirm completion of the assignment within the duration; This should be presented in person by the Consultant at the PMU office. Consultant must submit (3) hard copies and a soft copy of the approved inception report.

**Progress Report:** The Consultant shall prepare and submit monthly progress reports encompassing all the activities under the deliverables section of the assignment for the duration of the services. This report should be detailed, and include progress pictures and illustrations where necessary. The consultant shall provide all data required by Rural Electrification Agency's Project Management Unit / Nigeria Electrification Project to enable proper and timely monitoring of the contract and to ensure that the contract is completed on schedule. As part of the progress report, and based on service provider's programme of work, the Consultant is expected to inspect and verify all claims made by the service provider and submit site inspection reports for validation.

**Completion/Final Report:** Upon issuance of completion certificate to the service provider, the Consultant shall prepare and submit the Completion Report on the service detailing the project objective, work scope, achievements, problems, issues on the contract physical works implementation, project account statements and the consultancy service.

### List of Reports

The list of reports expected to be submitted are listed below

### Expected deliverables

<b>S/N</b>	<b>DESCRIPTION</b>	<b>DELIVERY TIMELINES</b>	<b>REMARKS</b>
1.	Inception Report	Four (4) weeks from commencement date	Upon submission and approval of the report
2.	Monthly Progress Report 1	8 weeks from commencement date	Upon submission and approval of the report
3.	Monthly Progress Report 2	12 weeks from commencement	Upon submission and approval of the report
4.	Monthly Progress Report 3	16 weeks from commencement x	Upon submission and approval of the report
5.	Monthly Progress Report 4	20 weeks from commencement x	Upon submission and approval of the report
6.	Monthly Progress Report 5	24 weeks from commencement x	Upon submission and approval of the report
7	Monthly Progress Report 6	28 weeks from commencement x	Upon submission and approval of the report
8	Monthly Progress Report 7	32 weeks from commencement	Upon submission and approval of the report
9	Monthly Progress Report 8	36 weeks from commencement	Upon submission and approval of the report
10	Monthly Progress Report 9	40 weeks from commencement	Upon submission and approval of the report
11	Monthly Progress Report 10	44 weeks from commencement	Upon submission and approval of the report
12	Draft Final Report	48 weeks from commencement	Upon submission and approval of the report
13.	Final Report	52 weeks from commencement	Upon submission and approval of the report

## **Reporting**

The Consultant will report to the Head, Project Management Unit (HPMU).

### **Consultant's Facilities**

**Housing and Office:** The Consultant shall arrange their own accommodation and office.

**Consultant Transportation:** The Consultants shall arrange rental vehicles, including all necessary costs, such as drivers, fuels, maintenance fees, and insurances.

**Equipment and Miscellaneous:** The Consultant shall arrange the office equipment, including computers with necessary software, at their own cost.

**Trips and Hotel Accommodation:** The cost of all travel and accommodation shall be included and arranged by the Consultant.

### **Duration of Assignment**

The proposed duration for the assignment shall be 12 months with an estimated 450 man-months.

### **Facilities/Data to be provided by the REA**

The REA-NEP, PMU will provide the Consultant with the relevant documents and information that will enable the consultant to meet the deliverables.

### **Remuneration and Payment**

Payments to the Consultant shall be made based on the time inputs of the staff and the actual expenditures incurred (evidenced with appropriate receipts) under the reimbursable component of the contract, as well as submission of the reports as listed earlier and acceptable to the Client.

Reports of each deliverable will be submitted as follows: 1 (One) Electronic copy and 3 (three) hard copies. After the delivery of each deliverable, REA-will review the submissions (Deliverables) and confirm whether the reports are satisfactory within one week. The consultant will incorporate comments into the final copies of the reports, which will be submitted in 3 (three) hard copies and 2 (two) soft copies.

### **Special Health and Safety Conditions**

Given the nature of this assignment, the consultant will need to take special precautions to avoid person-to-person transmission of COVID-19 as they carry out all activities under this TOR. This should include the use of personal protective equipment by all of the consultant's employees working in and around healthcare facilities, maintaining strict physical distancing for on-site and in-office activities, and following protocols for personal hygiene, for the duration of the contract. **The consulting firm is fully responsible for the health and safety of its workers.**

**Copyright and Ownership**

All raw and finished materials would be owned and copyrighted, permission to use materials by the consultant for other projects shall require a written permission of the employer and the Consultant shall maintain in strict confidence all information received from the employer concerning imports, financial records and nature of the business. Any existing intellectual property that the consultants bring into the project (e.g energy audit approaches, benchmark databases, etc.) will remain the property of the consultants, but any reports emanating from this material will become the property of the REA.

**Consultant Selection Method**

The Consultant will be selected in accordance with the Quality and Cost Based Selection (QCBS) Method set out in the Procurement Regulations for IPF Borrowers dated Fourth Edition November 2020, available on [www.worldbank.org/procurement](http://www.worldbank.org/procurement).