

TERMS OF REFERENCE (TOR)

SOFTWARE PLATFORM FOR AFRICAN DEVELOPMENT BANK (AFDB) FINANCED NIGERIAN ELECTRIFICATION PROJECT (NEP)

1. Background

In response to a request from the Federal Government of Nigeria (FGN), the Board of the African Development Bank (AfDB or the "Bank") approved a USD 200 million sovereign facility to support and finance the Nigeria Electrification Project (NEP or the "Project").¹ NEP will be implemented by the Rural Electrification Agency (REA or the "Implementing Agency"). The proceeds of the AfDB's financing for NEP will be applied across the following four components:

- i. **Component 1:** A minimum subsidy tender program awarding upfront subsidies to private sector developers to support the rollout of solar and/or hybrid mini-grid solutions across up to 250 sites split into a minimum 5 lots;
- ii. **Component 2:** A performance-based grant program incentivizing solar home system installation companies and mini-grid developers to incorporate the distribution and sale of energy efficient productive use appliances in their regular line of activities;
- iii. **Component 3:** Phase 3 of the Energizing Education Program (EEP), a government-led initiative that aims to install dedicated power systems for federal universities across the country's six geopolitical zones; and
- iv. **Component 4:** Technical assistance and capacity building for a wide range of public and private sector stakeholders in the country's off-grid sector.

The Project will contribute to: (i) more than 500,000 people obtaining access to electricity (approx. 105,000 households); (ii) approximately 76.5 MW in increased installed power generation capacity (of which, 68 MW will be from solar generation); (iii) eight universities obtaining access to reliable sources of energy; (iv) 20,000 Micro-Small and Medium- sized Enterprises (MSMEs) supported/supplied with productive use appliances and equipment; and (iv) the avoidance of 1.69 million tons of CO2 emissions.

2. Objectives of the Assignment

The goal of this assignment is to develop a web-based platform that will allow AfDB and the Nigerian Rural Electrification Agency to efficiently manage Components 1 and 2 of the NEP by interacting remotely with sector

¹ The World Bank and the FGN are also co-financing aspects of NEP. For the purposes of this TOR, the 'Project' refers to only those aspects of NEP to which proceeds from the AfDB's sovereign facility will be applied.

stakeholders, streamlining data management for GMG tendering, and monitoring individual GMG performance, with the ultimate aim of verifying new power connections and paying out results-based funding.

Component 1

Under Component 1, the Project will support Round 2 of the Minimum Subsidy Tender for Mini-Grids development, tendering 250 sites across the six geopolitical zones in the country. NEP will provide capital subsidies to enable mini-grid developers operate on a commercial basis while ensuring that their tariffs are affordable to average consumers. Subsidies will be provided through a Minimum Subsidy Tender, in which subsidies are granted to bidders with business plans requiring *the least amount of subsidy* to develop mini-grids across multiple sites and on a commercially viable basis. REA will provide market intelligence to bidders and offer partial grants for pre-investment activities under the Minimum Subsidy Tender program.

Component 2

The objective of Component 2 of the Project is to increase the productive use of energy in remote communities by increasing access to energy efficient productive use equipment and appliances. Increasing the productive use of electricity in rural communities is expected to (i) improve their economic and social development, as well as contribute to the modernization of their local economies; and (ii) improve the sustainability of the business models of mini-grid developers and off-grid solar companies – the former of which relies most heavily on productive loads for revenue.

As observed from industry practice in other regions – e.g. East Africa and India – energy access solutions providers become the de facto energy appliance retailers in remote and off-grid communities. Energy access companies generally have technical and commercial staff, access to markets, access to finance, and transport facilities that enable them to move between urban areas and the remote communities they are servicing. As remote communities do not have efficient channels for sourcing, financing, buying, and maintaining electric equipment and appliances, many energy access companies are absorbing these activities within their own operations.

Mini-grid developers in Africa, including in Nigeria, are increasingly transporting and retailing energy efficient productive use equipment to the communities they are electrifying, while stand-alone solar installation companies increasingly offer ancillary electrical appliances (i.e. TVs, stereos, fans, salon kits) as part of the kits they retail to their customers. It is in both the interest of mini-grid developers and other companies in the off-grid space to market and

commercialize productive use equipment, as well as encourage local capacity for maintaining this equipment.

In light of the above, Component 2 of the Project features a performance-based grant/subsidy mechanism that will support the incremental costs that energy access companies incur when including the distribution and sale of productive use equipment in their regular scope of operations. These grants, which would be provided to energy access companies upon confirmation that the relevant equipment had been sold and installed (i.e. presentation of receipts, photos, in-person independent verification, etc.), would cover incremental operational expenditures such as : (i) product transport, (ii) marketing and training; (iii) end-user financing; (iv) installation and end-user training; and (v) repairs, replacement and support. Grants provided through this mechanism are not intended to subsidize or reduce the retail prices of equipment for end-users. Component 2 of the Project has been allocated a budget of USD 20 million.

Assignment objectives

Under the assignment the consultant will implement a robust software platform enabling streamlined, efficient management of tendering and other financing processes, and reporting and monitoring of the mini-grids. This software platform will be used in the implementation of the Minimum Subsidy, Productive Use Performance-based Grants, and Energizing Education windows of the Nigerian Electrification Program.

Objectives of the assignment include:

- Provide the Nigerian Rural Electrification Agency and its partners (including and especially the AfDB) with a centralized data platform to manage its many mini-grid program activities and measure results and impact, including in real-time;
- Provide REA and its partners with the tools to effectively and remotely monitor/manage the results-based financing for Component 1 and Component 2 of the Project;
- Streamline the bidding and application procedures Components 1 and 2 by successfully deploying a secure, easy-to-use, accessible web-based platform that standardizes the approach by which REA implements the Project and through which REA will interact with developers and stakeholders according to a standardized and methodological approach;
- Provide the tools by which REA will be able to effectively disburse performance-based grants to developers according to reliable, remotely verified data points.

- Provide demographic and site-specific demand information that can be accessed by potential GMG developers participating in AfDB tenders for GMGs, utilizing a secure, robust database and user interface for advanced data management;
- Centralize all financing information into a single platform accessible by key stakeholders, improving accuracy and transparency in program implementation.

3. Scope of the Assignment

The Scope of Work for this assignment is divided into four key activities.

Activity A: Program Management

The Consultant will be responsible for managing the bidding and application processes for the Minimum Subsidy (Component 1) and Productive Use (Component 2) windows of the NEP. This work stream includes the following activities:

1. Implementation of a software platform to be used for the full bidding and application processes. Key features of the platform must include:
 - a. Program Management: An "Administrator" portal to set up programs within the software, manage bidders, set up deadlines, and upload program documents to be accessible to permissioned bidders
 - b. Tender Data Management: Functionality to share detailed site and lot market intelligence (location, demand, etc.) data with prospective bidders
 - c. Pre-qualification: Web-based application for participants' admittance into performance-based grants program; online tracking of application status with option to export submitted proposals; automated permissioning of successful applicants into next stages of application
 - d. Proposal Management: Structured work flow for bidders completing technical and financial proposals (for both Components 1 and 2), enabling advanced management of all proposal data, at the site-specific and portfolio level; automatic calculation of standardized technical and financial metrics across proposals
 - e. Submission Management: Secure electronic submission of technical and financial proposals; digital management of proposal status

Commented [EM1]: This activity is time-based. We expect this would be for the 30 months duration only (not the full 60 months, unless the tender bidding and productive use grant disbursement continues beyond 30 months). We would submit quarterly reports.

- f. Evaluation Module: Read-only, organized proposal review with data room for document management
 - g. Project-Specific Stage Tracking: For rolling project submissions (e.g. performance-based grant programs), ongoing project proposal submissions with messaging and status tracking between evaluators and project proponents
2. Customization of the software platform for implementation of program-specific procedures and requirements. Such customizations include:
- a. Customized URL, home page and program description page
 - b. Web-based pre-qualification forms for admission into programs
 - c. Web-based technical and financial proposal forms for qualitative and quantitative questions not addressed in project-specific proposals for tenders
 - d. Online check list of required documents for submission and verification of other program requirements
 - e. In-application notifications of key requirements or other announcements
 - f. Data room with folder organization structure and all program documents available for download to permissioned program participants
 - g. Program-specific question-and-answer forum for all program participants
 - h. Program-specific, detailed user manuals and help videos
3. Management of program participation, including:
- a. Participant registration and roster management
 - b. Management of communications to program participants and sub-segments of participants, via automated notification, emails, and an online user forum
 - c. Detailed in-person and webinar-based trainings with program participants and administrators at least three times a year.
 - d. Frequent live question-and-answer sessions for program participants

e. Ongoing support via live chat and email; detailed proposal reviews for completeness / proper use of software

f. Notifications of key activities taken on platform to relevant stakeholders

4. Ongoing maintenance and updates to the software platform

Activity B: Preparation of Market Intelligence for Site-specific Tenders

The Consultant will be responsible for securely storing, managing, and selectively sharing market intelligence data collected for the purposes of tendering mini-grid sites. Responsibilities include:

- Management of all specified sites in data platform, available in list view and geospatial map view; tracking of all key metrics related to sites (with option to export site lists and metrics)
- Import of detailed site survey data into secure database with option to export site-specific data
- Site survey data visualizations in user interface, including geospatial map view of geo-tagged loads
- Creation of forecasted site demand profiles based on survey data; load profiles derived from survey data according to standardized customer categorizations and segmentations. 105 of these sites have previously been identified and demand forecast has been completed on these 105 locations. These 105 sites have been uploaded into the platform and will only require the creation of the system sizing and financial models. The balance of 145 sites are yet to be identified and at such time as they are will need to be equally profiled and uploaded onto the platform.
- Import of technical system information from external system design models; creation of expected optimized system design using location and survey profile inputs, as well as provided costing inputs
- Creation of detailed financial models for each site and across portfolios of sites
- Site-specific detailed summaries, available for export in PDF form
- Storage of a set of "reference" sites for each round of site tenders, to be used by program administrators and evaluators for reference only

Commented [EM2]: This is lump sum. In the contract, kindly include two payment disbursements as we will be delivering the site profiles in two tranches (105 sites in Dec, the remaining 145 around March)

- Creation of “tender” sites with limited data sites to be shared with program bidders

Activity C: Productive Use Connection Verification

Commented [EM3]: Lump sum

The Consultant will implement a software module to enable the electronic submission of evidence of qualifying productive use appliance/equipment distribution and sale by an energy access company, confirming eligibility for performance-based grant funding under Component 2 of the Project. The software will meet the following requirements:

- The software will enable only pre-qualified participants of the performance-based grants program (i.e. Component 2) to electronically submit relevant projects (i.e. distribution and sale of select productive use appliances/equipment) for verification;
- Participants will have a mobile application or bulk upload feature to provide large quantities of connections and sales data, including information related to productive use appliances/equipment sold (year of manufacture, model, usage capacity, sales receipts, etc) and general customer information;
- The software will automatically connect to smart meter application programme interfaces (APIs) to verify electricity consumption and monitor electricity usage patterns to confirm whether the appliance/equipment is actually used (where APIs are already integrated with the platform) ;
- All submissions to the program administrator will be viewable within the administrator’s portal, viewable in list and map view (with the map view indicating the household/SME to which the productive use appliance/equipment was sold and delivered);
- The software will enable program administrators to review large volumes of connections and sales data to verify productive use connections and determine the amount of performance-based grant funding to be provided to pre-qualified participants (comparing claims made by pre-qualified participants against actual distribution/sales and usage data as recorded by the software);
- The software will display aggregated analytics about connections and sales data for users (i.e. REA and the AfDB)

Activity D: Monitoring and Evaluation

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The Consultant will be responsible for monitoring operating projects for the purposes of measuring program results and evaluating system performance.

The Consultant will deploy a robust web-based platform to facilitate advanced reporting by project developers to REA, AfDB and other relevant stakeholders (including NEP's Independent Verification Agent). The platform must have the following features:

- Highly secure data storage and management in a cloud-based database;
- Data storage and privacy policy that is consistent with prevailing international norms and laws and as relevant in Nigeria;
- Intuitive, user interface by which project developers can input data for individual mini-grid projects, including: a) organized document uploads; b) manual data entry; c) CSV uploads
- Dashboards and other data displays within the online platform, including detailed capital expenditure breakdowns (with automatic calculations of key CAPEX-related metrics); customer segmentation and identifying characteristics; tariff structures; generation system design; and financing structures;
- Explicit permissioning mechanisms by which project developers can share specific mini-grid projects within the platform – and selected data modules comprising a project – with other organizations, in particular REA and AfDB
- API integration with smart meter and inverter technology to directly display system performance over specified periods of time. Up to two (2) new API integrations will be included for systems that are not yet integrated with the platform. The following metrics will be tracked (when feasible with deployed system technology that has been integrated with the platform via APIs):
 - Active connections
 - Consumption patterns over specified time periods
 - Revenues billed / collected, tariffs charged
 - Battery efficiency
 - Generation (total, and over time) by type of generation source
 - Voltage drops
 - Downtime / outages
 - Component efficiency
 - Communication uptime for system data
- Dashboards with data measuring key performance indicators specified by the Quality Assurance Framework (subject to data availability);
- Dashboards containing data related to specific development outcomes that are relevant to the Project and its sponsors (i.e. REA and AfDB),

including a breakdown of connections and productive-use distribution data by gender (i.e. number of female-led households/MSMEs connected through Component 1 of the Project; number of female-led MSMEs and households obtaining productive use appliances/equipment through Component 2 of the Project, etc.);

- Dashboards to view a portfolio of mini-grid projects across one or many organizations, including a geographical map of project locations across all project developers who have submitted projects to NEP;
- Program dashboards to track key statistics including number and location of projects funded, total number of connections submitted, verified, and approved, etc.

Activity E: Ongoing maintenance and support of the platform

The Consultant will conduct necessary database, server, and user interface maintenance for the entire duration of the program. This includes bug fixes, period data testing, and server maintenance. In addition, the Consultant will provide ongoing user support for the duration of the program.

Activity F: Custom software development

Should the program design require custom development of the software platform, outside of the current customizable features (as outlined in Activity A), the Consultant will integrate such software features into the platform. Custom software development activities will be defined at a later date and the Scope of Work adjusted accordingly.

Commented [EM5]: Time-based, only have 30 months as this activity is covered by the previous for the first 30 months

4. Expected Deliverables

Activity A:

- 1) Deployment of customized web-based platform for the Minimum Subsidy Tender and Productive Use windows of the NEP, including program-specific user manuals and dedicated support forum
- 2) At least two detailed training for each program for program participants; at least one detailed training for each program for program administrators/evaluators
- 3) Regular program reports documenting program participation and key program management activities undertaken

Activity B:

- 1) Complete site-specific technical and financial profiles for all sites included in each tendering round (may be completed in tranches according to tendering rounds)
- 2) Deployment of digital platform to manage all market intelligence data for sites, with user interface to download or perform analyses on site data

Activity C:

- 1) Deployment of connections verification module, enabling collection and management of productive use data (including data collected via meter APIs when feasible) for result-based financing grants
- 2) Regular program reports documenting program participation and key program management activities undertaken
- 3) Quarterly reports detailing key metrics and development outcomes, to be delivered to the REA PMU and AfDB within the first week after the end of each quarter

Activity D:

- 1) Integration with generation system and metering technologies deployed for each site; implementation of web-based monitoring platform for project monitoring

5. Qualification and Experience

The Consultant shall have at least five years relevant experience in software development and management. The Consultant is expected to have

developed and deployed at least 2 similar software applications in the last 18 months.

The Consultant shall provide experienced personnel to carry out the assignment with the following minimum qualification:

- a) Senior Software Engineer with 10 years' experience in software development
- b) Engineer with 7 years' experience in power, solar, electrical or equivalent and 4 years' experience in specialized off-grid power production
- c) Program manager with 8 years' experience in the off-grid power sector (non-engineering acceptable) and two advanced graduate degrees in business and public policy

6. Duration

The Assignment should be completed within **60 months (5 years)**.

The Consultant is expected to leverage work already performed on the web-based platform that will be managing the overall Project.

7. Reporting arrangements

The Consultant shall report to the Head (AFBD) Project Management Unit of the Nigeria Electrification Project and the Managing Director, Rural Electrification Agency (REA)

8. Terms of payment

Payment to the Consultant will be made upon submission of documents listed below and acceptable to the client (i.e. REA). Each deliverable will be submitted as follows: One Electronic copy and 2Nos hard copies. After the delivery of each deliverable, REA-NEP will review the submissions (Deliverables) and confirm that the reports are satisfactory or not within one week.

S/N	Deliverables	Timelines	Payment Schedule	Payment Terms (% of Contract Sum)
	Activity A		100%	30%
1	Deployment of customized web-based platform for the Minimum Subsidy Tender and Productive Use windows of the NEP, including program-specific user manuals and dedicated support forum. (Quarterly Reports – 10nos.)	Every 3 months from contract signing	6% x 10 = 60%	
2	At least two detailed training for each program for program participants; at least one detailed training for each program for program administrators/evaluators	5 months from contract signing	40%	
	Activity B		100%	25%
1	Delivery of first batch of Site Profiles (99 Sites) in the Odyssey platform	2 months from contract signing	40%	
2	Delivery of second batch of Site Profiles (151 Sites) in the Odyssey platform	5 months from contract signing	60%	
	Activity C		100%	25%
1	Delivery of standardized template for pre-paid meter data and for ongoing meter data processing: Quarterly Report on Key Metrics and Development Outcomes (10nos.)	Every 3 months from contract signing	10% x 10 = 100%	
	Activity D		100%	10%
2	Project Monitoring and Evaluation Quarterly Report (10nos)	Every 3 months from contract signing	10% x 10 = 100%	
	Activity E		100%	10%
1	Ongoing Maintenance and Support Quarterly Reports from end of 30 months (10nos.)	Every 3 months after the end of 30 months	10% x 10 = 100%	
				100%

9. Selection Process

The Consultant will be selected in accordance with the Single Source Selection method set out in the AFDB Procurement Guidelines

10. 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.