

Terms of Reference for Baseline Survey for Global Multi-tier Measurement for Access to Energy (Package No. S-35)

Background

Over the last few decades, Bangladesh has emerged as one of the fastest growing economies in the world. The Energy sector plays an important role in shaping the economic landscape of Bangladesh. The growth and development of the economy is closely linked to the performance and expansion of the power sector, as it supports industrialization, agriculture, services, and other important economic activities. Bangladesh has achieved milestones in implementing the government's pledge to bring 100 percent of people under electricity coverage. The government's SDG goal is to deliver an affordable and quality supply for all. The demand for quality and uninterrupted electricity is growing day by day. Although electricity access has improved, there are still some challenges with consistency and reliability, especially in more remote or geographically difficult regions. Despite progress, power shortages remain an issue, especially during peak demand periods. To manage the growing energy demand, the present government is keen to reduce dependence on fossil fuels, focus on energy efficiency programs and demand-side management. Electricity tariffs in Bangladesh have historically been subsidized, making it challenging for the government to recover the cost. The government is gradually increasing tariffs, but the country is still facing problems related to the financial stability of the sector. A reliable, efficient, and affordable power supply is critical for the country's continued economic growth, industrialization, and social development. GOB now intends to conduct a baseline survey on access to electricity using the Multi-tier measurement. It intends to analyse and track the progress and level of energy access using multi-tier measurement of energy access.

The Baseline Survey for Global Multi-Tier Measurement for Access to Energy is a comprehensive initiative aimed at establishing a foundational understanding of energy access across different regions and demographics. This survey employs the Multi-Tier Framework (MTF), which categorizes energy access into tiers ranging from Tier 0 to Tier 5 (full access), based on various attributes such as capacity, availability, reliability, quality, affordability, sustainability, and health and safety. A "multi-tier baseline survey for access to energy" refers to an initial data collection exercise that utilizes the "Multi-Tier Framework" (MTF) to assess household access to electricity, going beyond a simple "connected/not connected" binary approach and instead considering access as a spectrum of service levels experienced by different households.

The Multi-Tier Framework (MTF) goes beyond simply determining if households are connected to electricity. It measures energy access based on several critical dimensions including seasonal variation. These include availability, which assesses how many hours of electricity users receive daily and whether there is 24/7 service. Quality evaluates the stability of the electricity supply, considering issues like voltage fluctuations and power outages. Affordability examines whether households can access electricity without compromising essential needs. Reliability focuses on the frequency and duration of outages, while sustainability looks at the share of electricity generated from renewable energy sources. Lastly, safety assesses whether electrical connections and appliances are secure for users. Therefore, even with 100% electrification, it is apparent that some households may still experience unreliable or low-quality electricity. Disparities in electricity service may exist between urban and rural areas, and the electricity provided may not always be affordable or sustainable. The data collected through the survey will support governments and other stakeholders in making informed decisions regarding energy investments and interventions.

The survey will help to highlight disparities in energy access between urban and rural areas, as well as among different socio-economic groups.

Therefore, Power Cell, Ministry of Power, Energy and Mineral Resources intends to appoint a reputed firm to conduct baseline survey on access to electricity. The firm must have extensive experience in household survey of at least fifty thousand households. The experience in rural inhabitant, power sector and Bangladesh will bring added advantage.

Scope of Work

The task has several major components as outlined below. Details of the activities are provided in the next section.

- 1) **Design and implement baseline surveys:** This will include developing samples for the surveys, hiring and training of the survey team, and finally implementing the surveys. The sample selection, questionnaire content and survey team are covered under specific tasks.
- 2) **Comprehensive Energy Assessment Framework:** Ideally, it should reflect the impact of all energy interventions—from generation to transmission and distribution, as well as pricing reforms and energy efficiency regulations. The approach should be applicable not only to households but also to small enterprises and community institutions as well. Finally, it should also allow a diverse range of data to be compiled into an index while identifying specific deficiencies of the energy supply.
- 3) **Carry out tier analysis of the data:** The consulting firm will carry out tier analysis and calculation of indices of electricity access based on multi-tier framework. The firm will also conduct basic descriptive analysis of the cleaned data.

Survey Procedures:

The consulting firm will be responsible for delivering high quality data according to the expectation and protocols of, and within a timeframe defined by the TOR. Specifically, the consulting firm will be responsible for the following activities and tasks:

- 1) **Design and implement baseline surveys:** This includes all the survey activities, starting from sample design to finalizing questionnaires, and administering the surveys. The activities under this task are described here.
 - a. ***Questionnaire development and revision:*** The consulting firm will develop survey questionnaires. The questionnaires will include:
 - Household roster
 - Household characteristics
 - Supply of and demand for electricity
 - Willingness to pay for a grid connection
 - Willingness to pay for solar device
 - Kerosene/fuel-based /candle lighting
 - Dry-cell batteries
 - Household fuel consumption
 - Use of cooking solutions and water heating
 - Consumption / expenditure
 - Household assets: electrical appliances

- Household economic shocks
- Time use
- Health impacts
- Women's empowerment

The questionnaires will cover modules for household and productive activities. The firm will also develop a community/village questionnaire. Based on the demand of the client, additional questions may be added to existing questionnaires. The consulting firm will be responsible for adapting the questionnaires to get context-specific responses, carefully considering the importance of cross-country comparability. The consulting firm will also be responsible for the translation of the questionnaires into Bangla. Consulting firm will review the questionnaire and improve the wording, ordering and placement of questions where necessary to ensure objectivity and accuracy.

- b. **Data Collection and Assessment Methodology:** The type of data required for a multi-tiered assessment of energy access in a given area would have to be obtained through surveys of actual energy availability and use among a scientific sample of all users in a given category (households, enterprises, community institutions). Survey questionnaires would elicit information about each survey attribute, and the results would be fed into the multi-tier matrices.
- c. **Estimate the sample size and design the sample:** The sample size for accurate assessment of tiers and calculation of indices of energy access for households and productive activities will be determined at RFP stage.
- d. **Recruit and train interviewers, field supervisors and data entry operators:** The Consulting firm will be responsible for hiring and training of survey interviewers, field supervisors, and data entry operators. Interviewers should be able to interact with all classes of people, be skilled at building rapport, and be experienced at dealing with numbers. The consulting firm will develop questionnaire and instruction manual (interviewer guide) for the trainings, which will cover detailed explanation of the questions, how to articulate them in an understandable way, how to approach the respondents and prompt them for accurate responses, and so on. Instruction manuals should be developed before the trainings start.
- e. **Provide logistical and other support to enumerators and supervisors:** The field enumerators and supervisors will require logistical support and subsistence during their stay in rural areas to conduct the field work. This support and relevant expenses (for transport, per-diem, etc.) have to be borne by the consulting firm in a manner consistent with the norm of similar surveys in Bangladesh.
- f. **Carry out the surveys:** The household or enterprise survey should be conducted during a single visit. In exceptional cases (for example, if the respondent does not have time to continue or is not at home) it may be necessary to return to a household or enterprise on more than one occasion, but this should not be the norm. For household survey, the questionnaire would preferably administered to household head (or head's spouse depending on the particular module of the questionnaire), and for enterprise survey the respondent should be the owner or the manager of the enterprise. The duties of the enumerators will be:
 - Visit the selected households/enterprises and ensure their participation;

- Conduct face-to-face interviews with the selected respondents, not without first obtaining permission;
- Note the answers accurately;
- Ensure completeness and accuracy of answers and perform accuracy checks on the questionnaires (whenever applies);
- Take note on any values for categorical variables that are not already defined in the questionnaire;
- Deliver completed questionnaires to supervisors;
- Safeguard the confidentiality and privacy of the collected information.

The duties of the supervisors will be:

- Explain clearly to each enumerator his/her duties and responsibilities;
 - Provide all logistical support and materials to field enumerators;
 - Supervise all activities of the enumerators during the data collection process through random spot checks;
 - Ensure that the interviewers undertake the survey in the households chosen for the sample without substitution;
 - Assess the quality of the work of the enumerators and the quality of the data from each completed questionnaire;
 - Ensure that the enumerators did not overlook inconsistencies and skip patterns;
 - Provide feedback to enumerators on quality assurance;
 - Liaise and report activities to the survey coordinator;
 - Check completed questionnaires and approve them for data entry
- 2) Clean data and archive them in suitable form: After completion of the survey, the firm is responsible for data entry and cleaning as mentioned in the Scope of Work. Much of the data cleaning should be performed with the basic value checks. At the end of data cleaning, the consulting firm should handover the data to client, with all variables labelled and adequately documented.
 - 3) Carry out descriptive analysis of the data: The consulting firm will carry out tier analysis and index calculation for energy access. For this, they will be provided formulas and detailed instructions. They will also conduct data analysis of the cleaned data. This involves reporting means, standard deviations, minimum and maximum values of major variables in each section. Findings should be reported in tables and/or graphs and included in the project completion report.
 - 4) Compile the findings in a project completion report: The consulting firm will write on the findings based on the survey and data analysis. All such findings will be part of the survey completion report. The report will include, among others, detailed description of pre-survey and survey activities, issues rose and the means adopted to resolve them, and findings from the data. The consulting firm will submit a draft version of the report to the client for comments, and will revise it after addressing the comments. The consulting firm is responsible for the overall quality of the report.
 - 5) Delivery of the data: The consulting firm will deliver the data and related documentation to the client. The data and documentation will be the property of the client, and the consulting firm may not use them in any way without the permission of the client.

Expected Outcome of the Baseline survey:

The Multi-Tier Framework (MTF) goes beyond simply determining if households are connected to electricity. It measures energy access based on several dimensions, such as:

- Availability: How many hours of electricity do users receive daily? Is there 24/7 service?
- Quality: Is the electricity supply stable, or are there frequent voltage fluctuations and outages?
- Affordability: Can households afford the energy services they need without compromising other essentials?
- Reliability: How often do outages occur, and how long do they last? Are they satisfied with prepaid meter (if applicable)? Did they pay utilities beyond the government charges through unauthorized dealing?
- Sustainability: Are the consumers using renewable sources through net metering?
- Safety: Are electrical connections and appliances safe for users?
- Etc.

Based on the tier analysis following matters need to be addressed also:

a) Energy Quality & Reliability Study

- Assess the **voltage stability**, frequency of power outages, and impact on households and businesses.
- Identify regions with **higher outage frequency and voltage fluctuations**.

b) Energy Affordability Study

- Analyze whether households can afford electricity and still meet other essential needs.
- Analyze what percentage of income is being used for electricity usage.
- Assess how energy tariffs affect low-income households and whether there are **subsidies or financial assistance** programs.

c) Renewable Energy Adoption Study

- Explore the penetration of **renewable energy** in both rural and urban areas. Explore the usage of renewable energies through net metering.

d) Energy Use and Economic Development Study

- Analyze how improved energy access impacts **income generation, education, healthcare, and small businesses**.
- Study the role of electricity in **job creation and women's empowerment**.

e) Consumer Satisfaction and Perception Study

- Conduct surveys to understand the **consumer experience**, focusing on their satisfaction with current energy services.
- Identify **gaps** between what is provided and what consumers expect or need.

f) Energy Efficiency and Consumption Behaviour Study

- Evaluate how households and businesses use electricity.
- Promote the adoption of energy-efficient appliances and conservation practices

Expected Man-months, deliverables and schedule of works

The duration of the survey will be approximately for 6 months. Indicative professional staff-months mentioned in later section. The team composition, task assignment and consultant fielding will be indicated by the consultant in response to the RFP. Following are the deliverables and tentative schedule for submission. They may be revised based on the load of the survey activities after the consulting firm is on board.

Reports:

- I. Inception Report:** Consultant will prepare and submit an Inception Report within 1 month from signing of the Contract, stating their jobs understanding, concept on the requirements of the assignment, readiness and strategy for undertaking the project.
- II. Interim Report:** Consultants will submit Interim Report within 2 months from the date of Contract signing. Consultants shall incorporate views of the stakeholders in the Interim Report.
- III. Draft Final Report (DFR):** Consultants shall submit Draft Final Report within 5 months from the date of Contract signing. Analysis the views of the stakeholders will be incorporated in the DFR.
- IV. Final Report:** Consultants shall arrange stakeholders Workshop in a suitable location with all power sector entities and incorporate comments received from the Workshop in the Final Report. Final Report shall be submitted within 6 months from the date of signing of the Contract.

Facilitation and Reporting

Power Cell will ensure access to the available relevant information to the assignment. The Consultant will work in close association with the Power Cell. A coordination mechanism will be in place to review progress, provide guidance and advice. Consultant will work under the guidance of the Power Cell. Day to day work would be monitored by a designated officer Director (Operational Performance), Power Cell.

Logistics Support for the Consultant

The Power Cell will provide counterpart support. Consultants will be supposed to use their own computers, transports, etc.

Key Expert Requirement

The preferred experience of proposed key expert is mentioned below:

- 1) **Project Manager/Team Leader (6 man-month):** At least Master degree in Engineering, Business or Urban and Rural/ Regional planning with minimum 15 years professional experience in public communication, survey, energy economics, customer outreach program and related activities.
- 2) **Energy Specialist (2 man-month):** At least Graduation in Electrical/Mechanical Engineering with at least 15 years working experience in power sector out of which minimum 10 years spent in public utility distribution system.
- 3) **Economist (2 man-month):** At least Masters/MBA in Economics/Finance with at least 10 years professional experience in data analysis and processing and also familiar with financial and economic analysis. Also shall have professional experience in data analysis and processing and also familiar with statistical software.

- 4) **Data Analyst (2 man-month):** At least Bachelor degree in Engineering/Science/Business with at least 5 years professional experience in data analysis.
- 5) **Social Impact Analysis Specialist (3 man-month):** At least Masters in Social Science with at least 10 years professional experience in SIA.
- 6) **Survey Coordinator (6 man-month):** At least Bachelor degree with minimum 5 years working experience in survey. The survey coordinator will conduct the survey.

Note: Consultant will appoint survey team for conducting survey and they will be part of non-key expert. This draft ToR will be finalized at RFP stage.