

## **CONSULTANCY SERVICES FOR DEVELOPING RURAL ENERGY SCALE UP MODELS TERMS OF REFERENCE**

### **Introduction**

Indus Earth Trust (IET) is Pakistan based, not-for-profit organization working in the area of sustainable development. Established in 2000 to aid neglected coastal communities in Pakistan, IET realized the impossibility of pin pointing a single issue hindering development. IET's approach to planned interventions has thus been of Integrated Development. Our projects target the main underlying issues affecting these communities under the six program areas of: Livelihood Employment and Enterprise Development Program and Livelihood Support Infrastructure; Water and Community Physical Infrastructure, Alternative Energy Solutions, Indigenous Housing Systems, Food Security, Drought Mitigation and Adaptation.

Tackling these program areas simultaneously uplifts and benefits communities in a holistic manner. It is our belief that this methodology results in long lasting and sustainable change.

IET works mainly in 6 districts in the Sindh and Balochistan provinces of Pakistan, mainly along the coast covering approximately 900 kilometers covering 13 Union Councils and approximately 392 villages. IET has recently expanded its work to include urban *katchi abadis* in Karachi. For a complete profile, please visit our website at <http://www.indusearthtrust.org/introduction/>

### **Rationale of the Assignment**

Drawing on experience of 10 years in implementing renewable energy projects in communities across the country, Pakistan Poverty Alleviation Fund (PPAF) has initiated Nurturing, Monitoring, Evaluation and Research (NMER) project with the idea to build and nurture community led renewable energy networks that can provide energy for basic household consumption plus support livelihoods and enterprises on a larger scale. The NMER project is a continuation of the idea of PPAF's previous renewable energy investments in communities beyond that for lighting only and making the renewable energy projects a gateway to improved livelihoods and incomes.

The two recent renewable energy mini grid pilots of PPAF are: 1) mini grids in Thatta, implemented by Indus Earth Trust (IET) under the project 'Just light is not enough' (JLINE) and another set up in Lakki Marwat through SABAWON. Financial models were prepared for all four JLINE villages to assess financial returns and sustainability—the financial modeling was done over a 20-year operational life for the solar generation and distribution asset. This model will now have to be calibrated and validated with the real-time operational data.

Under NMER, PPAF is keen to study the gaps and requirements so that the pilots can be replicated and taken to scale in a sustainable fashion. This 12 month long research on locally owned and locally sited renewable energy project will track monitor, and collect data to identify opportunities and threats linked to: livelihoods, sustainable use of resources, utilization of resources, climate change, and managing the grid. The project will also evaluate the mini grid's performance along the dimensions of people, planet, and profit-triple bottom line approach- as a tool to support sustainability.

NMER experiment design for research begins with installation of household metres in Jaffer Jokhio and Ishaque Jokhio. Cluster level metres in Hamzo Sammo and Bachoo Kolhi are already present. The

monthly consumption and payment data for 2 months will be recorded from these household and cluster level metres. After 2 months household metres will be installed in Hamzo Sammo and Bacha Kolhi and data recorded for 2 months. After a total of 4 months of data recording, baseline will be conducted in all four villages. Baseline report will be prepared. This consultancy will be done in a way that baseline findings and recommendations from PPAF's research under NMER are taken into account and incorporated.

## **Objective**

To come up with a sustainable Rural Energy Scale up delivery and business models for Pakistan Poverty Alleviation Fund.

## **Scope of Work**

1. Carry out a three tier analysis at global/regional, Pakistan, and PPAF:
  - a. Carry out a desk research of global/regional RE delivery and business models and identify potential for application in Pakistan.
  - b. Carry out a review of existing mini-grid community solar models in Pakistan run by different entities, e.g., government, local residents, and enterprises and support mechanism of solar mini-grids to local enterprises.
  - c. Carry out a technical and economic analysis of PPAF RE interventions based on analysis of completed and ongoing RE projects through multiple methodologies including field visits.

Each tier of analysis must reflect various systems including: Solar Home Systems, community based solar micro/mini-grid systems, Pay As You Go and rent to own system, Solar water pumps with main focus on drinking water supply schemes especially for supporting government initiatives to replace existing tube-wells with solar powered systems in KP, solar powered systems for health and educational facilities in terms of: application in local market; availability of solar products under these systems in markets; list of the companies in Pakistan providing these systems; assessment of financial institutions supporting these systems through microfinance schemes; use of digital payments by solar companies; tariff setting and collection mechanism; market opportunities and constraint factors.

2. Study the research outputs of PPAF's researcher to incorporate the findings and results in developing the Rural Energy Scale up delivery model. The PPAF's researcher's reports will be on: household consumption and payment; governance and management structure of microgrids, summary of baseline survey and recommendation for business model; report based on the endline survey describing the effects of actual business model.
3. Analyze and recommend mechanisms for long term sustainability of PPAF's solar mini-grids completed in Thatta, mini-grids completed under KfW funded HRE projects and elsewhere. The Consultant is expected to hold consultation with relevant stakeholders including government departments and civil society organization, renewable energy service providers and identify suitable business models to be implemented in PPAF future projects.
4. Assess flexibility and affordability for different levels of payment capabilities (using poverty scorecards) and propose business models for subsidization if required.

## **Deliverables**

1. Inception Report
  - a. Methodology for carrying out the study
  - b. A list of key stakeholders to be consulted
  - c. Schedule of meetings with IET and PPAF
  - d. Detailed work plan with time schedule and list of key activities
2. Report documenting three tier analysis of delivery and business models.
3. Stakeholder Consultation Workshop presentation and post Consultation Workshop report identifying suitable delivery and business models to be implemented in PPAF future projects
4. Draft Report submission and presentation to IET and PPAF to get feedback for the final report. The report will include the following.
  - a. Status of the energy sector and particularly the power sector (on and off-grid), energy sector stakeholder analysis, the status of renewable energy investments and markets, an assessment of the feasibility and viability of various renewable energy technology options in comparison to other alternatives and a renewable energy gap analysis concerning policy, incentive mechanisms and existing capacities.
  - a. Learnings from PPAF's research.
  - b. Recommendations for long term sustainability of PPAF's solar mini-grids completed in Thatta, mini-grids completed under KfW funded HRE projects and elsewhere
  - c. Rural Energy Scale up Delivery and Business Models for different levels of payment capacities (using poverty scorecards) for short, mid and long term RE interventions
5. Final Report

## **Duration of Consultancy**

120 person days of consultancy spreading over a period of 6 months around the completion of baseline study.

## **Professional Requirements**

- At least a post-graduate university degree in a relevant field (development economics, civil/mechanical/electrical engineering, sustainable energy systems, renewable energy, sustainable energy engineering, climate change, energy policy, climate finance, or similar).
- At least 10 years of relevant professional experience in expert advisory roles related renewable energy for international development.
- Proven experience advising international development projects, utility companies, and/or local governments in developing countries.
- Strong analytical, research, writing, and communication skills; proficiency in both English and Urdu is a precondition for this assignment.
- Previous work experience with PPAF and IET is an advantage

**Reporting and Coordination**

The consultant will report to the Chief Operating Officer of Indus Earth Trust and closely coordinate with the General Manager Renewable Energy and Senior Manager Quality Assurance, Research and Design at PPAF. The consultant will keep IET and PPAF up to date on project status and challenges.

**Selection Method**

The consultant will be selected in accordance with PPAF's procurement guidelines.