



Terms of Reference

SAP ID 140276, Grant No. 2000003725, WBS 140276-1-01-04

Consultancy Services for the design of a sub-regional renewable energy mini-grid program for Pacific Island Countries and Territories (PICTs)

1. Introduction

The promotion of renewable energy mini-grid markets, industries and innovation in Pacific Island Countries and Territories (PICTs) is a priority area of the newly created Pacific Centre for Renewable Energy and Energy Efficiency (PCREEE), based in Tonga. In partnership with the United Nations Industrial Development Organization (UNIDO) and financial support from the Korean Energy Agency (KEA), the centre has started to develop its renewable energy mini-grid program. The program aims to address existing barriers by strengthening exchange of knowledge, lessons learned and data, capacity building, policy advisory and the promotion of innovative business models and entrepreneurship. In this context, the partners seek external consultancy services.

2. Background

Rural electrification challenges in PICTs

In general, access to reliable and affordable modern energy forms remains a central challenge to approximately 6.3 million persons in a region with less than 10 million inhabitants. It is in Papua New Guinea (PNG) - the PICT with the largest population and land area – where the biggest share of population without access to electricity can be found. But also in other smaller countries quite a substantial part of the households and businesses in remote islands away from the power utility grids remain unelectrified or depend on expensive diesel powered mini-grids. Urban electrification and main-island grid systems function reasonably well.

PICTs range in size from about 12 km² of land (Tokelau) to nearly 463,000 km² (PNG), most having between several hundred and several thousand km². These unique geographical characteristics, where long distances separate sparsely populated areas, result in high costs of supplying electricity, particularly to remote and rural areas. Access to these rural areas or remote islands can be difficult due to the lack of adequate infrastructure or services, and the ability to contribute towards the payment for these services is hindered by low income levels. Although there has been an integrated approach to rural development (energy, health, education, agriculture and environment) in a number of PICTs, progress is still relatively limited.

In many PICTs, the provision of rural electrification to islands and remote communities throughout the country has been an explicit policy objective for several decades. However, in many PICTs rural electrification lacks clear policies and the quality of service needs significant improvement. Where explicit policies do exist, they are often ambiguities regarding the role of the national power utility and private developers. Subsidies for rural electrification tend to be high. Policies regarding customer charges for rural electrification are often ad-hoc, with communities or households in the same geographical area experiencing very different costs and standards for similar electrical services.

Clear policies, better institutional arrangements, consistent and transparent subsidy arrangements and reconsideration of tariff policies would contribute towards improving the rate of rural electrification substantially in some PICTs. Rural electrification has traditionally been cross-subsidised

by the urban centres. Increased access to energy services at affordable prices can only be effectively achieved through tailored approaches and mechanisms. The unique circumstances in the respective PICTs – coupled with a lack of energy data, capacity, experience and finance, to name a few challenges – have in many cases denied Pacific communities access to reliable, affordable and environmentally sound energy for their respective development activities.

Renewable energy (hybrid) mini-grids

In recent years, decentralized renewable energy solutions, such as stand-alone systems or mini-grids, have become an important tool to promote rural electrification under more competitive terms in PICTs. Rapidly decreasing technology costs, increasing reliability, and a growing track record of deployment has strengthened the case for accelerated adoption of stand-alone and mini-grid solutions. Globally, off-grid solutions are estimated to supply nearly 60% of the additional generation needed to achieve universal access. Renewable energy mini-grids tap into locally available resources to deliver electricity services. Relying on a single energy source (*e.g.*, solar, wind, hydro, biomass) or a combination (*e.g.*, solar diesel hybrids), mini-grids provide varying electricity service levels (or tiers).

At this point, there is no universally agreed definition of what constitutes an off-grid system, mini-grid system, or stand-alone system. Stand-alone systems tend to either be small and/or exist where the owner has no intention to connect them to a wider grid. These include for example residential solar home systems (SHSs). A mini-grid is an integrated local generation, transmission and distribution system serving numerous end-users that can stand on its own.

Hybrid powered mini-grids can provide steady community-level electricity service, such as village electrification, offering also the possibility of a wide range of productive uses and can be upgraded through grid connection in the future. Mini-grids allow the integration of several renewable energy sources (*e.g.* biomass, hydro, PV, wind) and often require the integration of diesel generator back-up to ensure 24 hours generation. There are mini-grids which exceed a capacity of 500 kW. In general, mini-grids tend to be more cost-effective for electrification of settlements than individual stand-alone systems. However, the intermittence of many renewable energy sources very often requires a diesel-generator as a back-up.

In recent years, PICTs have made considerable progress in the creation of enabling national environments for the promotion of decentralized renewable energy solutions. Many countries adopted specific electrification targets for remote island areas and have started with the installation of renewable energy powered mini-grids or the hybridisation of existing diesel powered mini-grids. However, despite growing investments, the sector has not reached the needed economies of scale and did not transform into a vibrant private-sector driven business sector with local value creation. Moreover, the lack of domestic manufacturing and servicing capacities is questioning the sustainability of these investments, as in most cases technology and expertise continues to be imported.

Due to their complexity, renewable energy mini-grid markets and industries face various barriers. The lack of appropriate policies, capacities, knowledge, finance and a stimulating business environment are constraints that restrict upscaling and dissemination. Traditionally, government agencies, state-owned utilities, community groups, nongovernmental organizations, and, in some cases, local private firms have driven mini-grid development in PICTs. Despite some progress in bringing electricity to a number of areas, limited economic sustainability and scalability have remained key challenges for growth. There is a stronger need for private sector involvement and entrepreneurship. From local entrepreneurs to bigger utilities, there is growing interest from the private sector in the development, financing, operation and management of mini-grids.

3. Objectives and deliverables of the assignment

The overall objective of the consultancy assignment is to support PCREEE in the development of a sub-regional program to promote renewable energy (hybrid) mini-grid markets, industries and innovation. Concretely, the assignment includes the following key tasks: (a) develop a PICTs renewable energy mini-grid market and industry report; (b) develop a detailed concept note on the PCREEE mini-grid program in line with international donor standards, and (c) contribute to the preparation and execution of a PCREEE renewable energy mini-grid conference and expo. Interested bidders shall propose an effective implementation methodology and activity plan for the assignment in their technical offers. The assignment required strong engagement and coordination with local stakeholders (i.e. PCREEE Secretariat, the engineering department of the University of the South Pacific, Pacific Islands Sustainable Energy Industry Association, etc.). The contractor must provide the following deliverables:

Deliverable 1: Inception report

Based on an initial telephone/skype conference meeting the contractor will provide an inception report on the assignment. The inception report will include a detailed activity plan, time schedule, a list of key literature to be reviewed, a list of key stakeholders to be consulted, schedule of stakeholder workshops and meetings, assessment questionnaires and the table of contents of the assessment and concept note.

Deliverable 2: PICTs Renewable energy mini-grid market and industry report

Based on extensive desk research and stakeholder consultations, the contractor will produce a comprehensive PICTs renewable energy (hybrid) mini-grid market and industry report. The report shall be written in a way that it can be updated regularly by PCREEE in the upcoming years. The document will provide a good overview on the market potential, status and trends, existing barriers and opportunities, as well as concrete recommendations on how PCREEE can contribute through regional interventions, tools and methodologies. The report will be based on existing project information, statistics, stakeholder consultations and interviews, as well as updated assessment work of the past (e.g. SOPAC). The baseline report will include case studies from all three PICTs sub-regions – Melanesia, Micronesia and Polynesia regions. The assessment requires a strong partnership between the contractor and a domestic partner in PICTs with excellent knowledge on the mini-grid market. The report will be widely disseminated through the PCREEE and the Pacific Regional Data Repository for Sustainable Energy for All (PRDR). The contractor will provide all raw data and calculations sheets to UNIDO and PCREEE to be included into the PRDR.

Deliverable 3: Concept note on the PCREEE renewable energy mini-grid program

Based on the recommendations of the market and industry report, the contractor will develop a detailed concept note on the envisaged PCREEE mini-grid program in line with international donor standards (e.g. GEF, GCF, EU, ADB). The concept note will include a detailed result framework (logical framework) and a draft budget. The contractor will actively approach potential cooperation partners and donors.

Deliverable 4: Provision of input for the PCREEE mini-grid conference and expo

The contractor will contribute as follows to the PCREEE mini-grid conference and expo:

- Provide inputs on the workshop concept note and agenda;

- Contribute to the invitation list and the identification of potential mini-grid technology exhibitors from South Korea and other countries;
- Present the results of the assessment and concept note by using power point presentations;
- Take the minutes and incorporate received comments in the assessment and concept note;

The organization of the workshop lies in the responsibility of PCREEE and UNIDO. The contractor will contribute to the preparation and execution of the event by providing inputs as described above.

4. Scope of work and time schedule

TASKS	DELIVERABLES	ESTIMATED WORKING DAYS (w/d) SPREAD OVER 8 MONTHS
1. Inception meeting and report	Inception report approved by UNIDO and PCREEE (incl. detailed activity plan, time schedule, list of key literature and stakeholders, schedule of stakeholder meetings, assessment questionnaire(s), tables of contents of the report and concept note)	3 working/days
2. Develop a PICTs renewable energy mini-grid market and industry report	PICTs renewable energy mini-grid market and industry report (incl. graphs, raw data and editable calculation sheets; fully edited and ready to be published in English)	50 working/days
3. Develop a concept note on the PCREEE mini-grid program	Concept note on the PCREEE renewable energy mini-grid program (incl. graphs and editable calculation sheets; fully edited and ready to be published in English)	12 working/days
4. Support the preparation and execution of a PCREEE mini-grid conference and expo	Inputs for the preparation and execution of a PCREEE renewable energy mini-grid conference and expo (GHG methodology, result framework, workshop presentation, outline for the strategic platform);	10 w/d working/days
TOTAL		75 w/d (home based and in the region)

The activities under this contract shall be completed within a period of **eight (8) months** from the effectiveness of the contract. The proposed plan for implementation of activities and deliverables:

Deliverables	Months								Suggested Payments
	1	2	3	4	5	6	7	8	
Deliverable 1 – Inception Report	█								20%
Deliverable 2 – Market Assessment	█	█	█	█					30%
Deliverable 3 – Concept Note				█	█	█			

In addition, the consultant will be required to deliver the following:

- Item **High-resolution photographs (min. 3 MB, at least 20)** – that illustrate the undertaken activities. The consultants will cede all appertaining rights to unlimited use of the respective pictures to UNIDO and PCREEE.
- Item **All used raw files and calculation sheets** in editable form (e.g. xls)

5. Coordination and Reporting

The consulting company will report to the UNIDO Project Manager and the PCREEE Manager and will closely coordinate with the KEA and other PCREEE partners. All draft and final deliveries are subject to approval of UNIDO and PCREEE before these can be concluded.

6. Qualification and Evaluation Criteria

QUALIFICATION REQUIREMENTS

Envisaged Profile of the Contractor:

The assignment needs a multi-disciplinary team of international and domestic experts with strong expertise in the area of renewable energy mini-grids in the PICTs context. Evidence must be included in the technical proposal, which should demonstrate the following:

Qualification of the Contractor

- Registered South Korean company/institution with public and private consulting experience in the areas of sustainable energy and industrial development;
- The assignment requires a consortium with a domestic partner or employment of local experts with excellent knowledge of renewable energy mini-grid trends in PICTs;

Qualification of the Team

- Team members demonstrate a balanced academic background related to the renewable energy sector. Additional qualifications in renewable energy mini-grids represent a strong added value;
- Team leader should have a track-record of at least five (5) years of consulting or project development experience, including preparation of feasibility studies in renewable energy, preferably in mini-grids;
- Good knowledge of the PICTs energy sector and related work experience;
- Experience of projects involving international donor organizations;
- Demonstrate very strong analytical writing skills; Ability to coordinate an inter-disciplinary team and manage complex assignments in a multi-cultural setting;
- Strong problem solving, communication, research and analytical writing skills;
- Availability throughout the whole consultancy service period, to regularly engage in phone calls or Skype meetings with the core team and relevant partners;
- Fluency in English. The working language for the assignment will be English, including all reports and communication.
-
- Fluency in English: The working language for the assignment will be English and all relevant reports and communication will be in this language.

7. Application Procedure

Applicants shall submit their written proposals in English:

- Short technical proposal (including proposed approach and methodology, work and activity plan, detailed CVs of experts, copies of university degrees, certifications, licenses as well as proven track record of implemented assignments).
- Examples of technical reports, including feasibility studies written by the project team in the past;
- Financial proposal in USD (including all costs and taxes, as well as a detailed work-time-expert-diagram indicating daily rates for individual team members).

Applicants are requested to submit their proposals no later than 18:00 hrs. (CET) of 14 December, 2017 by registering on the UNIDO procurement page (www.unido.org/procurement). In case of difficulties, applications could exceptionally be sent to procurement@unido.org. The bidder should, however, provide an objective and convincing justification for not having submitted via the procurement system.

8. Additional information

<http://www.unido.org/>

[Global Network of Regional Sustainable Energy Centres](#)

<http://www.pcreee.org/>

Applicants are strongly encouraged to contact the PCREEE Secretariat (info@pcreee.org), in order to get a better understanding regarding the baseline conditions and potential local stakeholders.