

## Request for Quotation

### Consultancy for Technical Assistance for the Tuvalu Photovoltaic Electricity Network Integration Project (TPVENIP)

June 2008

1. The Government of Tuvalu has proposed the installation of a 40kW Photovoltaic system to be integrated into the electricity grid network at Vaitupu (TPVENIP), the largest island of the eight islands in Tuvalu. The project has been made possible though funding provided by the Italian Government through an agreement signed between the Government of Italy represented by the Ministry of Foreign Affairs and the Ministry of Environment, Lands and Sea and the Pacific SIDS Permanent Missions based at the United Nations in New York. Further the Government of Italy through its representatives ministries mentioned above has in turn signed an agreement with IUCN to be the implementing agency for this programme. IUCN has delegated its Oceania Regional Office based in Suva, Fiji to manage the programme. IUCN-Oceania is commissioning a consultancy to support the Government of Tuvalu through a technical assistance.
2. Quotations are requested from parties that are willing and able to undertake the services as specified in the detailed Terms of Reference (TOR) in Annex I.
3. Instructions to Bidders:
  - a. The Quotation must cover all the objectives, outputs and activities as specified in the TOR (Annex I)
  - b. The Quotation must include costs for professional fees. Travel cost and per diem will be reimbursed according to IUCN regulations.
  - c. US\$ only must be used in the Quotation. The fee budget for the consultancy is limited to US\$ 50,000.
  - d. The Quotation must include:
    - i) Executive Summary  

Provide an overview of your proposal for the provision of the services as described in this RFQ. The overview should include a summary of the major benefits which, in your opinion, TEC would gain if you are accepted, and an overview of your capability to carry out the work and of any subcontractors/partners which you propose to engage in connection with the provision of the proposed services.
    - ii) Organisation

Provide a brief history of your organisation, including core business areas. This information should encompass all entities of any consortia)

iii) Services & Delivery

- a. Describe your capability and experience, including your core skills, systems and technology relevant to the delivery of the required services.
- b. Demonstrate your organisation's capacity to meet the requirements for consultancy services as outlined in Annex 1(4)
- c. Describe your experience in the provision of similar services to other customers.
- d. Provide details of what contingencies you would put in place to minimise any interruption to performance of the service.
- e. Detail how you will deliver the services specified in Annex 1(4)

iv) Innovation

Bidders are invited to identify and detail where they can add further value or innovation. Your response should address the opportunities identified in Annex 1(4)

v) An updated CV;

vi) Information on availability;

vii) Total person days proposed for the work on the consultancy and daily rate in US\$; and

viii) A preliminary methodology and work plan of not more than 6 pages

e. The consultancy preferably should commence in September 2008 and must be finalized before end of December 2008.

f. The offer must be in the English language only

g. The above-mentioned documents, information and requirements are mandatory and as such are required to form a complete tender. An offer will be rejected unless it is substantially responsive

h. If the Quotation is received prior to the formal submission date corrections/modifications can be made up to that date

i. The Quotation must be submitted in electronic format only (Word or PDF-format, 1 MB max) by email to the e-mail address specified in below

j. The final working plan will be determined subsequently between the successful Contractor and IUCN-Oceania

k. Confirmation of receipt of quotations will be provided by e – mail within three working days.

- l. Successful as well as unsuccessful bidders will be informed by e-mail as soon as possible.
- m. Award of contract and Evaluation criteria. Quotations will be evaluated according to the following criteria:
  - i. Price (30 %)
  - ii. Experience of expert in grid connected PV systems for mini electricity grid network 30 %
  - iii. Relevant regional experience in Pacific Island countries 10 %
  - v. Methodology/Work Plan 30%
- n. Deadline for the submission of quotations is 5 September, 2008, 16.00 hours Fiji time (GMT+12)
- o. Contact Information:

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## Annex I

### Terms of Reference for the Technical Assistance for the Tuvalu Photovoltaic Electricity Network Integration Project (TPVENIP)

#### 1. Introduction

IUCN-Oceania in collaboration with the Tuvalu Government through the Tuvalu Electricity Corporation (TEC) and the Tuvalu Department of Energy is commissioning a consultancy for the **Tuvalu Photovoltaic Electricity Network Integration Project (TPVENIP)**.

#### 2. Objective

The overall objective of TPVNIP is the promotion of the use of renewable energy resources through the implementation of cost effective, equitable, reliable, accessible, affordable, secure and environmentally sustainable energy systems. In this particular project, the use of grid connected Photovoltaic system is seen as a step towards achieving the above objective.

#### 3. Background

##### 3.1 General Information

Tuvalu lies about 1100 km due north of the Fiji Islands and is centred at about 8° south latitude and 177° east longitude. The EEZ is 900,000 km<sup>2</sup> in area. The total land area of 26 km<sup>2</sup> is spread over 8 islands. The largest, Vaitupu, has an area of about 5.6 km<sup>2</sup> while the smallest, Niulakita, has only 0.42 km<sup>2</sup> of land.

Like any other atoll the soil is low in fertility and only a narrow range of food plants can be supported. The sea is the primary source of local food. The climate is tropical to equatorial. Rainfall averages 3500 mm per year with April – November lower than the rest of the year. Droughts do occur and maintaining a fresh water supply on the densely populated Funafuti the main business and political centre is increasingly a problem. The primary source is rainwater but there is a 65,000 litre per day desalination plant in use.

Tuvalu depends heavily on imported petroleum fuels. British Petroleum (BP) through a non-competitive agreement is currently supplying petroleum fuels to Tuvalu. However, supply to the outer islands is through the Tuvalu Cooperative Society and are transported in 200 litre drums. Liquid Petroleum Gas (LPG) is brought in containerised bulk tanks and this is through a private entrepreneur. Prices of petroleum fuels are determined by the suppliers in the absence of a price regulator. On the other hand the price of electricity for consumers is controlled by Government.

### **3.2 Government Priority**

The Government of Tuvalu is placing high priority to promotion of renewable energy as a means of cushioning its economy from the ever increasing fuel price. The current global oil shock is having a devastating effect not only in the increase in cost of imported oil but also cost of all other imported products as well, including food, household equipment and building materials. These negative economic and social aspects are even more pronounced in the outer islands than on Funafuti.

It is clear that any actions aimed at reducing imported oil dependency will help decrease greenhouse gas (GHG) emissions, reduce Tuvalu's impact on global warming and put Tuvalu on the road of a sustainable and exemplary development, giving the nation a stronger bargaining position in international negotiations.

### **3.3 Tuvalu Electricity Corporation**

(1) The government owned Tuvalu Electricity Corporation (TEC) manages all grid-based electrification on all islands. There is no formal regulation of the TEC although setting tariffs does require a cabinet decision. The TEC regulates others through their imposition of Australian standards for wiring and safety in electricity system installation and servicing. The 2007 review<sup>1</sup> of the TEC base tariff reveals that TEC requires an average of AUD0.80/kWh (before allowance for capital expenditure, depreciation and government subsidy) which is almost twice the current average tariff of AUD0.44/kWh. The review further stated that due to the monopoly fuel supplier the fuel costs in generation alone is AUD0.40/kWh, which leaves AUD0.04/kWh from the AUD0.44/kWh tariff to fund all of TEC's operating costs. Tuvalu is experiencing high diesel power generation cost of about US\$0.50/kWh at present due to the continuous escalating crude oil price.

(2) On the other islands, combinations of diesel generation plants purchased in 2000 together with low voltage line (and 11kV in Vaitupu) supply the seven islands.

A summary of the existing supply and demand situation is provided in the table below:

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<sup>1</sup> Conducted by Ridgeway Capital Projects Ltd of New Zealand, and funded by the SOPAC Pacific Islands Energy Policy and Strategic Action Planning (PIEPSAP) project in October 2007.

Summary of TEC Generation and Sales Data (2006)									
	Generation Capability & Production				Sales and Network Losses				
	New Units	kVa Avail	kWh	kWh/l	PK kW	LF	kWh in 2006	Growth 2004-6	Losses
Fogafale	3x600 kW	3230	5,255,601	3.76	920	65%	4,484,329	7%	14%
Nanumaga	P60, P60,P100	220	96,591	2.40	36	31%	103,150	9%	-8%
Nanumea	P60, P60,P100	220	104,909	2.44	34	35%	101,584	13%	2%
Nuitao	P60, P60,P100	220	77481	2.52	28	32%	77,980	4%	-2%
Nui	P60, P60,P100	220	76762	1.97	29	30%	78,692	4%	-4%
Nikufatua	P60, P60,P100	220	111317	2.55	37	34%	108,251	4%	2%
Nukulaelae	P60,P60, P60	180	65,418	2.12	26	29%	66,401	9%	-3%
Vaitapu	P100,P60, P100	260	302,450	2.54	74	47%	275,131	11%	8%

Note

Outstation peak demand mainly occurred at night time compared to Fogafale during day time.

TEC is facing three major challenges that need to be overcome if the organisation is to have a commercially sound future. The first challenge is how TEC is going to reduce its fuel usage and thereby the country's reliance, on expensive imported diesel fuel. The second hurdle is how TEC will reduce its base operating cost by rationalising the use of its surplus generation plant, and the final concern is how TEC can better monitor and manage its technical and commercial losses to bring them down from an estimated 16% to an industry standard of about 7%.

#### 4. Scope of Work

The scope of work for the consultancy will include, but not necessarily be limited to, the following activities:

- Carry out a scoping mission to Vaitupu and accurately assess the actual current power demand and a 10 year projected demand for the Vaitupu grid;
- Estimate operating expenditure of the 10 year period;
- Estimate investment requirements to meet demand;
- Determine the technical feasibility or otherwise of the proposed PV integration system and future expansion;
- Recommend the most proven and appropriate option of PV system to match the Vaitupu grid characteristics base on the current and future demand;
- Estimate the replacement costs per kWh of the major components and anticipated fuel savings from the chosen PV system to match the Vaitupu grid characteristics and other proven PV systems.
- Identify the appropriate site/location for the installation of the PV system.
- Provide set of recommendations required for the sustainability of the project based on past experiences of PV system in the Pacific.
- Prepare tender documents for the design, supply and installation of the recommended PV system taken into consideration the tropical climate in Tuvalu;
- Liaise closely with the Contractor during the installation of the PV system;
- Liaise closely with the TEC Engineer designated to the project; and
- Ensure the TEC Engineer has full advantage of hands on experience available during the scoping mission and the installation of the PV system.
- Identify training areas required for the sustainability of the project and provide set of recommendations to strengthen the Institutional Capacity of the station.

## **5. Outputs**

The following are the expected outputs:

- Inception Note

Write-up an inception note comprising the Consultant's understanding of the consultancy and associated tasks; identification of issues crucial to the successful completion of the consultancy; and comments on this TOR. Subsequently, if required and approved by IUCN and TEC the activities can be elaborated, modified, etc.

- Debriefing Note

- Prepare debriefing note, based on the desk study, preliminary findings, conclusions and recommendations from the scoping mission; and

- Discuss the debriefing note with the General Manager and staff of TEC, the Energy Unit and, task force, and if appropriate, with the Board of Directors of the TEC.

- A scoping mission report
- A final report covering all the tasks highlighted above

## 6. Reporting Requirements

<b>Deliverables</b>	<b>Deadline</b>
1. Inception Note	Before start of mission to Tuvalu
2. De-briefing Note	Before departure from Tuvalu
3. Scoping Mission Report	End September 2008
4. Final Evaluation Report	Third week November

## 7. Consultant

The consultancy shall require the services of qualified power utility practitioners with skills in distribution and generation and preferably with experience in solar PV technologies.