

**Alternative Energy Promotion Centre (AEPC)
Renewable Energy for Rural Livelihood (RERL)**

REQUEST FOR PROPOSAL FOR CONSULTING SERVICES

RFP No. RERL/09/2018

Title of Consulting Services

**Feasibility Study of Electric Clean Cooking Program in
Solabang, Rukum**

Project Name : Renewable Energy for Rural Livelihood (RERL)

Office Name : Alternative Energy Promotion Centre (AEPC)

Office Address : Khumaltar Height, Lalitpur, Nepal

Financing Agency: RERL

Date of RFP Issue: 23 May 2018

Deadline for Submission of RFP: 5 June 2018

Date.....

Dear Sir/Madam

Subject: Feasibility Study of Electric Clean Cooking Program in Solabang, Rukum

Please study the evaluation criteria and provide the relevant information

To enable you to submit a proposal, attached are:

- i. Instruction to OfferorAnnex I
- ii. General Terms and Conditions of the ContractAnnex II
- iii. Proposal Submission FormAnnex III
- iv. Financial Proposal Submission Form.....Annex IV
- v. Terms of Reference (TOR).....Annex V

Your offer comprising of both a technical proposal and a financial proposal, in a separate sealed envelopes, should reach the following address no later than **5 June 2018**.

The National Programme Manager
Renewable Energy for Rural Livelihood (RERL)
Khumaltar Height, Lalitpur, Nepal
Phone: 01 5539390, 5539391, Fax: 01 5542397
Website: <http://www.aepc.gov.np/rerl/>
Email: rerl@aepc.gov.np

If you required additional information, we are ready to provide information, but any delay in providing such information will not be considered a reason for extending the submission date of your proposal.

Yours sincerely,

Satish Gautam
National Programme Manager (NPM)

A. Introduction

1. General

The purpose of this RFP is to invite technical and financial proposals from the potential consulting firms who have skill, knowledge and expertise for "**Feasibility Study of Electric Clean Cooking Program in Solabang, Rukum**".

2. Cost of Proposal

The offeror shall bear all costs incurred during submitting the proposal. The offeror shall bear all costs associated with the preparation and submission of the proposal. RERL will in no case be responsible or liable for those costs, regardless, of the conduct or outcome of the evaluation of this proposal.

B. Solicitation Documents

3. Contents of solicitation documents

Proposals must offer services for total requirement. The Offeror is expected to examine all corresponding instructions; forms, terms and specifications contained in the solicitation Documents. Failure to comply with these documents will be at the offeror's risk and may affect the evaluation of the Proposal.

4. Clarification of solicitation documents

The offerors requiring any clarification of the Solicitation Documents can forward their queries in the following email address

Email: rerl@aepec.gov.np

5. Amendment of solicitation documents

At any time prior to the deadline for submission of proposals, the RERL may, for any reason, whether at its own initiative or in response to a clarification requested by a shortlisted Offeror, modify the Solicitation Documents by amendment.

All offerors that have received the Solicitation Documents will be notified in writing of all amendments to the Solicitation Documents. In order to afford prospective Offerors reasonable time in which to take the amendments into account in preparing their offers, RERL will notify in time.

C. Preparation of Proposals

6. Applying for providing services

The Offerors need to read the RFP including the ToR and prepare proposal accordingly. The proposal must address all the requirements of the proposal including required documents.

7. Language of the proposal

The proposal prepared by the Offeror and all correspondence and documents relating to the proposal exchanged by the Offeror and the RERL shall be written in the English language.

8. Documents comprising the proposal

The proposal shall comprise the following **mandatory documents**:

- a. Proposal submission form
- b. Organizational Profile/Brochure—describing the nature of business, field of experience, licenses, certification and accreditations
- c. Certificate of Registration
- d. VAT certificate
- e. Tax Clearance Certificate of 2073/74
- f. Track records of Human resource- with list of similar services relevant to objective and scope of works included in this RFP.
- g. CVs of proposed human resources signed by concern individual
- h. The proposal must provide clear methodology to meet the activities proposed for completing this task

9. Proposal form

The Offeror shall structure the operational and technical part of its proposal as follows:

i. Proposed methodology

This section should demonstrate the Offeror's responsiveness to the specification by identifying the specific components proposed, addressing, the requirements, as specified, point by point, providing a detailed description of the essential performance characteristics proposed warranty; and demonstrating how the proposed methodology meets or exceeds the specifications. **This section should explain clearly how the required information as mentioned in the scope of work in the attached ToR will be collected and analyzed.**

Pricing information shall be separated and only contained in the appropriate Price Schedules.

It is mandatory that the Offeror's Proposal numbering system corresponds with the numbering system used in the body of this RFP. All the references to descriptive material and brochures should be included in the appropriate response paragraph, though material/documents themselves may be provided as annexes to the Proposal/response.

Information which the Offeror considers proprietary, if any, should be clearly marked "proprietary" next to the relevant part of the text and it will then be treated as such accordingly.

ii. Summary Sheet

The Offeror is required to prepare a summary sheet (Table 1) with information related to previous or ongoing work relevant to this study.

Table 1 Summary sheet

SN	Name of the program/project	Contract agency	Duration	Amount of contract

Note: Please mention only settlement, infrastructure or urbanization sector program/project

iii. Qualification of the Service Provider

The consulting firm (Offeror) must have at two years of experience in renewable energy projects. Preference will be provided to the consulting firms with prior experience in study, design and installation of solar PV mini grid systems. The consulting firm must be legally registered as per the rule of Government of Nepal and provide the following documents

- a. Consulting Firm/Company Registration Certificate
- b. VAT Registration Certificate
- c. 2073/74 Tax Clearance Certificate

iv. Human Resource Requirement

Team Leader: The Team Leader must have a minimum of Bachelors Degree in Electrical/Electronic/Mechanical Engineering with minimum of 7 years of experience in the field of energy (electrical and/or thermal). The candidate should also have a minimum of 3 years experience in research and development in the field of renewable energy. Demonstration of these experience related to electric cooking is strongly desired. The team leader should also demonstrate evidence on data logging technologies and devices in the previous projects.

Statistical Analyst: She/he should have a minimum of Bachelors Degree in Statistics/Economics/Engineering/Science with minimum of 5 years of experience in analysis and interpretation of raw/field level data. The Data Engineer/Analyst will also be responsible for statistically validating data for the entire cycle of the project, including survey, data collection, outcome of analysis and recommendations. Relevant experience in renewable energy and specifically in cooking will be highly desired.

Social Expert: The Social Analyst should have a minimum of Bachelors Degree in Sociology/Anthropology/Human Behavior/Science with minimum of 5 years of experience in renewable energy projects and programs. Candidates with previous experience in rural and urban cooking, adaptation, gender and consumer behavior would be considered ideal for this position.

10. Proposal prices

The Offeror shall indicate on an appropriate Price Schedules, the price of a service it proposes to supply under the contract. The VAT should be included in the offer, if applicable. The tax will be deducted at source as per prevailing tax rule of the government.

11. Proposal currencies

All prices shall be quoted in the Nepalese Rupees (NRs)

12. Period of validity of proposals

Proposals shall remain valid for One Hundred And twenty (120) days after the date of the Proposal submission prescribed by the RERL, pursuant to the deadline clause. A Proposal valid for a shorter period may be rejected by RERL on the grounds that it is non-responsive.

In exceptional circumstances, the RERL may solicit the Offeror's consent to an extension of the period of validity. The request and the responses there to shall be made in writing. An Offeror granting the request will not be required or permitted to modify its proposal.

13. Format and signing of Proposals

The Offeror shall prepare the Proposal. The Proposal shall be in typed or written in indelible ink and shall be signed by the Offeror or a person or persons duly authorized to bind the Offeror to the contract. The latter authorization shall be indicated by written power-of-attorney accompanying the proposal.

The Proposal shall contain no interlineation, erasures, or overwriting except, as necessary to correct errors made by the Offeror, in which case such corrections shall be initialed by the person of persons signing the proposal.

14. Estimated Completion Date

The desired delivery date for completion of this task is 5 months after signing the contract.

15. Payment

The RERL shall effect payments to the Contractor/Offeror after acceptance by the RERL of the invoices submitted by the Contractor/Offeror. The payments will be made in installment basis based on deliverables.

Amount in percentage

Payment

- | | |
|---------|---|
| i) 40% | Immediately after Signing Contract. |
| ii) 30% | After submission of draft report |
| ii) 30% | After submission of final report and approval from of AEPC/RERL |

D. Submission of Proposals

16. Sealing and marking of Proposals

The Offeror shall seal (lahachhap) the proposal in one outer and two inner envelopes, as detailed below.

- (i) The outer envelope shall be

Addressed to:

The National Project Manager
Renewable Energy for Rural Livelihood (RERL)
Khumaltar Height, Lalitpur, Nepal
Phone: 01 5539390, 5539391, Fax: 01 5542397
Website: <http://www.aepc.gov.np/rerl/>
Email: rerl@aepc.gov.np

And,

Marked with:

"Feasibility Study of Electric Clean Cooking Program in Solabang, Rukum"

Both inner envelopes shall indicate the name and address of the Offeror. The first inner envelope shall contain the information specified in clause 8 (Proposal Form) above. The second inner

envelope shall include the price schedule and price schedule of individual Offeror duly identified as such.

NOTE, if the inner envelopes are not sealed and marked as per the instructions in this clause, the RERL will not assume responsibility for the Proposal's misplacement or premature opening.

17. Deadline for the submission of Proposals

Proposals must be received by the RERL at the address specified under clause *Sealing and Marking of Proposals* no later than **17:00 hrs, 5 June 2018**.

RERL may, at its own discretion extend this deadline for the submission of Proposals by amending the solicitation documents in accordance with clause *Amendments of Solicitation Documents*, in which case all right and obligations of the RERL and Offerors previously subject to the deadline will thereafter be subject to the deadline as extended.

18. Late Proposals

Any Proposals received by RERL after the deadline for the submission of Proposals, pursuant to clause *Deadline for the submission of Proposals*, will be rejected.

19. Modification and withdrawal of the Proposals

The Offeror may withdraw its proposal after the Proposal's submission, provided that written notice of the withdrawal is received by the RERL prior to the deadline prescribed for the submission of the Proposals.

The Offeror's withdrawal notice shall be prepared, sealed, marked, and dispatched in accordance with the provisions of the Clause *Deadline for Submission of Proposals*. The withdrawal notice may also be sent by telex or fax but followed by a signed confirmation copy.

No proposal may be modified subsequent to the deadline for the submission of the Proposals.

No Proposal may be withdrawn in the interval between the deadline for submission of proposals and the expiration of the period of the Proposal validity specified by the Offeror on the Proposals Submission Form.

E. Opening and evaluation of the Proposals

20. Opening of proposals

The RERL will open the Proposals in the presence of AEPC and UNDP representatives at the Programme Office.

21. Clarification of the proposals

To assist in the evaluation and comparison of Proposals, the Purchaser may at its discretion, ask the Offeror for clarification of its Proposal. The request for clarification and the response shall be written form and no change in price or substance of the Proposals shall be sought, offered or permitted.

22. Preliminary examination

The Procurer will examine the Proposals to determine whether they are complete, whether any computational errors have been made, whether the documents have been properly signed, and whether the Proposals are generally in order.

Arithmetical errors will be rectified on the following basis: If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price errors, its proposal will be rejected. If there is a discrepancy between the words and figures the amount in words will prevail.

Prior to the detailed evaluation, the Procurer will determine the substantial responsiveness of each Proposal to the request for Proposals (RFP). For the purposes of these clauses, a substantially responsive Proposal is one which confirms to all the terms and conditions of RFP without material deviations. The producer's determination of a proposal's responsiveness is based on the contents of the proposal itself without recourse to extrinsic evidence.

23. Evaluation and comparison

Total Score (100%) = Technical Evaluation (70%) + Financial Evaluation (30%)

Maximum Total Score = 1000

The Financial Proposal carries a total score of 300 points. The points for the financial proposal will be allocated as per the following formula:

$$\frac{\text{Lowest Bid Offered}^*}{\text{Bid of the Firm/Offeror}} \times 300$$

* “Lowest Bid Offered” refers to the lowest aggregate price offered by proposers scoring at least 70% points in Technical Evaluation.

The Contract will be awarded to the (agency/Organization/Firm) Offeror scoring the highest combined scores (Technical and Financial).

Technical evaluation criteria will be as follows:

Summary of technical proposal evaluation form	Score weight	Point obtainable
Expertise of the firm submitting proposal	20%	200
Methodology, its appropriateness to the ToR, condition and timeliness of the implementation plan	50%	500
Qualification and experience of personnel	30%	300
Total		1000

NOTE: Seventy percent weightage will be given to technical proposal and thirty percent for financial proposal.

Form 1: Criteria for evaluation of expertise of the firm

SN	Criteria	Obtainable points	Company/Firm				
			A	B	C	D	E
1	Minimum of 2 Years of Experience in Renewable Energy Projects and 1 year of experience with electric cooking stoves.	90					
2	Organizational structure (size of the firm, strength of project management, annual turn-over)	40					
3	Completed task relevant to this activity	70					
	Sub-total	200					

Form 2: Criteria for evaluation of approach, methodology and appropriateness

SN	Criteria	Obtainable points	Company/Firm				
			A	B	C	D	E
1	Understanding of Scope of Work	60					
2	Proposed approach and methodology	100					
3	Innovative use of IT, Datalogger and Survey Technique	100					
4	Timeline plan	40					
	Sub-total	300					

Form 3. Criteria for evaluation of proposed human resources

SN	Criteria	Obtainable points	Company/Firm				
			A	B	C	D	E
Team Leader	Bachelors Degree in Electrical/ Electronic/Mechanical Engineering with minimum of 7 years experience in the field energy (electrical and/or thermal)	30					
	Minimum 3 years of experience in R&D in renewable energy	110					
	Specific experience relevant to the proposed task (esp. in electric cooking and data logging)	100					
Statistical Expert	Minimum Bachelors Degree in Statistics/Economics/Engineering/ Science with minimum of 5 years of experience in interpretation of data	30					
	Specific experience in renewable energy/cooking	100					
Social	Bachelor in Sociology/Anthropology/	30					

Expert	Human Behavior/Science with minimum of 5 years of experience in renewable energy						
	Previous experience in rural and urban cooking, gender, adaptation and consumer behavior	100					
Sub-Total		500					

F. Award of contract

24. Award criteria, award of contract

The RERL reserves the right to accept the proposal or reject all proposals at any time prior to award of the contract, without thereby any liability to the affected Offeror or any obligation to inform the affected Offeror or Offerors of the grounds for the Purchaser's action prior to the expiration of the period of proposal validity, the RERL will award the contract to the qualified Offeror whose proposal after being evaluated is considered to be the most responsive to the needs of the organization and activity concerned.

25. Purchaser's right to vary requirements

The purchaser reserves the right at the time of award of the contract to vary the quantity of services and goods specified in the RFP without any change in price or other terms and conditions.

26. Signing of the conditions

After the evaluation of the proposals, **a selected Offeror will be asked to enter into contract.** Within 5 days of the receipt of the contract, the successful Offeror shall sign and date the contract and return it to the purchaser.

General Terms and Conditions of the Contract

1. Independent Relationship

Nothing contained in the contract shall be construed as establishing or creating between Government and the Organization the relationship of a master and a servant or principal and agent, it being understood that the Organization is an independent person vis-à-vis Government.

2. Organization /Expert/Consultant's General Responsibilities

- The organization shall carry out services under this contract with due diligence and efficiency and in conformity with the highest standards of professionals and ethical competence and integrity.
- The Organization shall act at all times so as to protect, and not be in conflict with the interests of Government.
- The organization shall be responsible for the professional and technical services provided by him/her in the implementation of this contract.

3. Workmen's compensation and other insurance

The organization shall make his/her own arrangements regarding insurance for the medical expenses and for an accident, death and permanent disability for the period of this contract. All costs involved will be borne by the Organization.

4. Source of Instruction

The organization shall neither seek nor accept instructions from any authority other than NPC/RERL's authorized agent in connection with the performance of services under this contract.

5. Prohibition on conflicting activities

The Organization shall ensure that he/she will not directly/indirectly engage in any activity that would conflict with those of RERL in respect of this evaluation.

6. Officials no to benefit

The Organization warrants that no RERL has been or will be admitted by him/her to any direct/indirect benefit arising from this contract or award thereof.

7. Assignment

The Organization shall not assign, transfer, pledge or make other disposition of this contract or any other parts thereof rights, claims or obligations under this contract, without prior written approval of RERL.

8. Records, Accounts, Information and Audit

- The organization shall maintain accurate and systematic records and accounts in respect of the services to be performed under this contract.

- The Organization shall furnish, compile or make available at all times to RERL any records or information, oral or written, which RERL may reasonably request for in respect of the services to be performed under this contract.
- The Organization shall allow RERL or its authorized agents to inspect and audit all such records or information upon reasonable notice.

9. Language

Unless otherwise specified in this contract, English language shall be used by the Organization in all written communications to RERL with respect to the services rendered and with respect to all documents procured or prepared pertaining to such services.

10. Equipment of property

Equipment or property furnished to the organization with funds supplied or reimbursed by the RERL or its agent shall be the property of the RERL and such equipment shall be returned to the duly authorized official of RERL upon completion of the services, conclusion of this contract or upon completion of the services, conclusion of this contract or upon termination thereof or when no longer required by the Organization. Such equipment or property when returned to RERL shall be in the same conditions as when delivered to the Organization, subject to the normal wear and tear. The organization shall in any event, be liable to RERL for the loss of or damage to such equipment or property through his/her fault or negligence.

11. Confidential Nature of Documents

All maps, drawings, photographs, mosaics and plans.

12. Amendments

The terms and conditions of this contract may be amended only in writing signed by both parties to this contract or their duly authorized representatives.

13. Obligation to Inform RERL of change in condition

The organization shall promptly and fully notify RERL in writing of any conditions, which interferes, or threatens to interfere, with successful carrying out of the services under this contract. Such notice shall not however relieve the Organization of his/her obligations to continue to provide services under this contract. Upon receipt of such notice, RERL shall take such action as in its sole discretion it considers to be appropriate or necessary under the circumstances.

14. Taxation

The Organization shall be liable for any tax levied on the remuneration and allowances paid as per this contract. Income tax on the remuneration and allowances paid to the organization will be deducted at source.

Proposal Submission Form (Company Letter Head)

The National Programme Manager
Renewable Energy for Rural Livelihood (RERL)
Khumaltar Height, Lalitpur, Nepal
Phone: 01 5539390, 5539391, Fax: 01 5542397
Website: <http://www.aepc.gov.np/rerl/>
Email: rerl@aepc.gov.np

Dear Sir,

Having examined the Solicitation Documents, the receipt of which is hereby duly acknowledged, we, the undersigned, offer to provide services to conduct evaluation of the "**Feasibility Study of Electric Clean Cooking Program in Solabang, Rukum**" for the sum as may be ascertained in accordance with the Price Schedule attached herewith and made part of this proposal.

We undertake, if our proposal is accepted, commence and complete delivery of all services specified in the contract within the time frame stipulated.

We agree to abide by this Proposal for a period of 120 days from the date fixed for opening of Proposals in the invitation for proposal, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

We understand that you are not bound to accept any proposal –whole or part –you may receive.

Dated this day/Month of year

Signature

Name

Position

Stamp

Duly authorized to sign Proposal for and on behalf of

Financial Proposal Submission Form

PRICE SCHEDULE

The Consulting Firm/Contractor is asked to prepare the Price Schedule along with the cost breakdown (as provided in this annex IV below) in separate envelop. All prices/rates quoted must be inclusive of all taxes. The Price Schedule must provide a detailed cost breakdown. Provide separate figure for each functional grouping or category. The format shown on the following pages should be used in preparing the Price Schedule. The format includes specific expenditures, which may or may not be required or applicable but are indicated to serve as the examples. Therefore, it should be considered as broad guidelines for Price Schedule (s).

Cost Breakdown by Cost Component [*This is only indicative*]:

S.N.	Particulars	Quantity	Unit	Rate NRs	Amount NRs.
A	Human Resource				
1	Team Leader		MD		
2	Statistical Expert		MD		
3	Social Expert		MD		
4*	*Electric Cooking Appliances (Infrared, Induction, Slow Cooker, Low Wattage, Storage, etc.)		No.		
5*	*Data Logging equipment and accessories		No.		
B	Travel cost and DSA				
C	Total (A +B)				
D	VAT (13%) of C				
	Total (C+D)				

Notes:

1. Financial proposals will be selected on the basis of compliance with RERL costing parameters.
2. Payment will be made only for the activities mentioned in the financial proposal.
3. *The number of appliances and appliance level data logging should be based on the sample proposed in the methodology by the consultant

(Signature)

[Name and Signature of the Service Provider's Authorized Person]

[Designation]

[Date]

(Office Stamp)

Proposed Study

on

Feasibility Study of Electric Clean Cooking Program in Solabang, Rukum

1. Introduction

Alternative Energy Promotion Centre (AEPC) is the apex Government body established in 1996 with major objective of promoting Renewable Energy Technologies for enhancing rural livelihood. Under AEPC, UNDP-GEF-RERL Programme has been implemented, from 1 July, 2014 upon the successful completion of the Rural Energy Development Program (REDP) and Renewable Energy for Rural Livelihood (RERL), with main focus on supporting AEPC to remove barriers for up scaling RETs for enhancing rural livelihood.

2. Rationale of the Study

The 60 kW Sakha Khola III Micro Hydropower Plant located in Solabang, Rukum experienced a rapid increase in demand of electricity boosting local economy and contributing towards generation of local employment. Electricity produced from this plant is not only used for lighting households but is also playing a major role in running heavy equipment workshops to repair trucks, commercial scale furniture industry, dairy and numerous semi-urban scale shops and enterprises. These growing opportunities are also attracting migrant workers from different parts of the region.

As the population grows, demand of household electricity is also on the rise. The rise of energy in general is creating demands for new household appliances chiefly for cooking. With increase in access of transportation, liquefied petroleum gas (LPG) is increasingly popular in the villages. While most of the villagers still use firewood as the primary source of energy for cooking, followed by LPG, few households are reported to be using induction heaters for cooking meals, rice cooker for rice and electric boiler for boiling water. Hotels and restaurants have even more diverse use of electricity to run appliances such as mixer/grinder and roti maker and appliances for cooling and storing food.

The small village of Solabang is experiencing rapid increase in electricity demand with unceasing introduction of new electrical appliances. While this could be seen as a positive indicator for local economy and livelihood, the village is also dependent on a single micro hydropower plant. To balance the supply and demand, the study aims to look specifically on implementation and impact of electric cooking appliances on micro hydropower plant. The study will systematically identify a normative behavior of household cooking to develop sets of standard cooking profile. Available electric cooking technologies such as low wattage, heat storage, infrared and induction cookers will be tested and proposed to fit in the profile. The overall assessment will include both technical and consumer behavior. Use of data-logger on both micro hydropower plant and appliances will measure the electric interactions and daily consumer logging to measure convenience, practicality and safety of the users.

3. Objectives of the Study

As mentioned in the background, the major interest of the study is to identify electric cooking stove or stoves as a complete or intermediary solution of cooking in rural communities. The study will be conducted in Solabang, Rukum with a micro hydropower plant of capacity of 60 kW providing electricity to nearly 525 customers. The customers are divided into single and three-phase users

with 6 Amps, 16 Amps and 32 Amps Miniature Circuit Breaker (MCB). The study proposes to identify the following outcomes from the study

- Develop cooking profile of the community
- Propose electric solution or solutions to fit the profile
- Test the appliances in lab to technically verify the match
- Test on the site to measure technical (plant and load) and consumer behavior
- Propose and recommend solution based on the outcome
- Conduct overall assessment, including assessment of convenience, safety, willingness for ownership, hydropower plant behavior, adaptability and availability of technology and local manufacturing.

4. Scope of Work (activities)

The study shall include, but not limited to, the following activities:

4.1 Cooking Profile

- a. Existing usage trend of household level and hotel/restaurant cooking to develop cooking profile
- b. Assessment of fuel type, usage (including thermal parameters), cost and time spent for preparation of meal and convert the attributes in terms of cost or any other recommended reference for comparison with post-electric cooking intervention
- c. Tabulate the data including number of meals per day, type of meals, duration for preparation, size of household and customers in hotels
- d. Conduct comprehensive literature review of existing profile documents within Nepal and relevant countries

4.2 Electric Cooking Appliance

- a. List the available electric cooking (also water boiling/heating) appliances in a table and also list potential appliances available globally along with electrical, thermal and cost parameters
- b. Identify electric cooking appliance or mix of appliance to fit the cooking profile of household and hotels
- c. Conduct pre-testing and logging of data of each of the appliance proposed (the consultant can use available research report to select the appliances for testing at this stage)
- d. Conduct daily assessment of usage over a month (or within a statistically accepted level) and record electrical, thermal and behavioral data from the users

4.3 Plant Behavior

- a. Conduct pre-assessment of peak- and off-peak electric profile of the plant including real and reactive power
- b. Conduct impact assessment of the plant to find behavior of the plant due to electric cooking

- c. Logging of daily generation profile for over the entire period of study but require monthly pair-wise data for each of the electric cooking appliances and the plant
- d. Propose maximum intervention of electric cooking that can be achieved within the study area

4.4 Data Logging

- a. Thermal data of the existing cooking stoves and data from the electric cooking (daily and monthly data)
- b. Electric data of the plant (daily, monthly and over the interval of the study)
- c. Electric data of the appliances (daily and monthly)
- d. The consultant should also assess household and shops/restaurants to finalize the installation of data logger (including wiring, protection system, multi-plugs and other equipment)
- e. Data Logger
 - i. Based on the sample proposed, up-to 6 units of Emon-Pi (each unit consists of Emon Tx + Emon Pi and 4 Current Sensors) can be accessed through RERL upon request (please see openenergymeter.org for further reference to this appliance level data logger). This can be used for household and shops. Consultant can also use their own data-logger for monitoring appliances.
 - ii. For micro hydropower plant, the consultant should propose their own data logger

4.5 User Adaptability

- a. The study will prepare a manual user data entry which the user will use to record data related to meal preparation (this must contain: daily meal plan, meal type, measurements, start time, end time, level of convenience, safety, satisfaction, etc.). Any device for measurement shall be proposed by the consultant. Any data logging methods, using digital tablet based entry, is also upon the consultant to propose.
- b. The focus in this section would be on adaptability of the technology or technologies and further assessment technique shall be proposed by the consultant
- c. The consultant will finalize the assessment and recommend the adaptation of the technology (mostly on willingness and capacity of owning such appliances) used in the study
- d. The consultant should also identify the gap and propose solution (or solutions) that would to be possible future solution for research and development of such products

4.6 Market Adaptability

- a. The study will identify availability of the appliances including cost of system, installation, repair and maintenance
- b. The focus will also be on solutions that can be manufactured inside Nepal along with proposition of any service that can be available inside the country

- c. Focused on the study area, the consultant shall recommend the maximum intervention of electric cooking that can be achieved in the area

4.7 Methodology

- a. The methodology should meet the minimum requirement of standardized survey for publication and the consultant must undertake all the activities including consent of survey, participation and data logging
- b. The consultant must provide evidence based methodology (a framework with indicators wherever possible) with contents as proposed in the proposal within the proposed time duration of the study

5. Inputs from AEPC/RERL

There will be following inputs for completing the assignment:

- a. Details of Focal Persons of the proposed sites
- b. Appliance monitoring device (6 set of Emon-pi, Emon-tx and CTs) while the monitoring device for the plant must be made available by the consultant

6. Expected Deliverables

- 6.1. Monthly progress report (for 5 months or number of months not exceeding 5 months)
- 6.2. Final Draft report (at the end of 5 month or duration as proposed by the consultant not exceeding 5 months)
- 6.3. The final draft report shall include all the activities as proposed in the Scope of Work
- 6.4. The final draft report will be presented by the consultant in the presence of AEPC and other stakeholders