

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

**REQUEST FOR PROPOSAL FOR CONSULTING SERVICES**

**RFP No. RERL/07/2021**

**Title of Consulting Services**

**Conducting Technical Training on Operation and Maintenance of  
Continuously Stirred Tank Reactor (CSTR) based Large Biogas/Waste to  
Energy Projects**

**Project Name:** Renewable Energy for Rural Livelihood (RERL)

**Office Name:** Alternative Energy Promotion Centre (AEPC)

**Office Address:** Khumaltar Height, Lalitpur, Nepal

**Financing Agency:** AEPC/CREF/RERL

**Date of RFP Issue:** 4 December 2021

**Deadline for Submission of RFP:** 14 December 2021

Date: 4 December 2021

Dear Sir/Madam

**Subject: Conducting Technical Training on Operation and Maintenance of Fixed Dome Continuously Stirred Tank Reactor (CSTR) based Large Biogas/Waste to Energy Projects**

Please study the evaluation criteria and provide the relevant information

To enable you to submit a proposal, attached are:

- i. Instruction to Offeror ..... Annex I
- ii. General Terms and Conditions of the Contract ..... Annex II
- iii. Proposal Submission Form ..... Annex 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 **16:00 hours, 14 December 2021**.

The National Programme Manager  
Renewable Energy for Rural Livelihood (RERL)  
Khumaltar Height, Lalitpur, Nepal  
Phone: 01 5544146, Fax: 01 5544576  
Website: <http://www.aepc.gov.np/rerl/public>  
Email: [rerl@aepc.gov.np](mailto:rerl@aepc.gov.np)

If you require 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

## Instruction to Offeror

### A. Introduction

#### 1. General

The purpose of this RFP is to invite technical and financial proposals from potential consulting firms who have skill, knowledge and expertise for "**Conducting Technical Training on Operation and Maintenance of Continuously Stirred Tank Reactor (CSTR) based Large Biogas/Waste to Energy Projects**".

#### 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: [muhan.maskey@aepec.gov.np](mailto:muhan.maskey@aepec.gov.np)

#### 5. Amendment of solicitation documents

At any time prior to the deadline for submission of proposals, 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. A copy of firm registration certificate
- c. A copy of PAN registration certificate
- d. A copy of VAT registration certificate
- e. Tax Clearance Certificate of last FY 2076/77
- f. Power of attorney to sign the document
- g. Organizational Profile
- h. Self-declaration
- i. Signed CV of professionals
- j. Any other relevant documents to prove eligibility and qualification to carrying out the tasks

### **9. Proposal form**

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

#### **i. Institutional Capacity**

The Offeror will describe its institutional capacity in brief including year of incorporation, facility and equipment, organizational structure, human resources and completed major study in similar field.

#### **In case of Joint Venture, Consortium or Association**

- If the Proposer is a group of legal entities that will form or have formed a joint venture, consortium or association at the time of the submission of the Proposal, they shall confirm in their Proposal that: (i) they have designated one party to act as a lead entity, duly vested with authority to legally bind the members of the joint venture jointly and severally, and this shall be duly evidenced by a duly notarized Agreement among the legal entities, which shall be submitted along with the Proposal; and (ii) if they are awarded the contract, the contract shall be entered into, by and between RERL and the designated lead entity, who shall be acting for and on behalf of all member entities comprising the joint venture.

- After the Proposal has been submitted to RERL, the lead entity identified to represent the joint venture shall not be altered without prior written consent of RERL. Furthermore, neither the lead entity nor the member entities of the joint venture can:
  - a) Submit another proposal, either in its own capacity: nor
  - b) As a lead entity or a member entity for another joint venture submitting another Proposal.
- The description of the organization of the joint venture/consortium/association must clearly define the expected role of each of the entity in the joint venture in delivering the requirements of the RFP, both in the Proposal and Joint Venture Agreement. All entities that comprise the joint venture shall be subject to the eligibility and quality assessment by RERL.
- Where a joint venture is presenting its track record and experience in a similar undertaking as those required in the RFP, it should present such information in the following manner:
  - a) Those that were undertaken together by the joint venture; and
  - b) Those that were undertaken by the individual entities of the joint venture expected to be involved in the performance of the services defined in the RFP.
- Previous contracts completed by individual experts working privately but who are permanently or were temporarily associated with any of the member forms cannot be claimed as the experience of the joint venture or those of its members, but should only be claimed by the individual experts themselves in their presentation of their individual credentials.
- If a joint venture's Proposal is determined by RERL as the most responsive Proposal that offers the best value for money, RERL shall award the contract to the joint venture, in the name of the designated lead entity. The lead entity shall sign the contract for and on behalf of all other member entities.

## **ii. Management Plan**

This section should provide corporate orientation to include the year and the state/country of incorporation and brief description of the Offeror's present activities related to the sector. It should focus on services related to the proposal.

This section should also describe the organization unit(s) that will become responsible for the contract, and the general management approach towards a project of this kind. The Offeror should comment on its experience conducting similar programs and identify person(s) representing the Offeror in any future dealing with the RERL.

## **iii. 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 delivered.

**The operational and the technical parts of the Proposal should not contain any pricing information whatsoever on the services offered.** 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.

### **iii. Qualification of the Service Provider**

The consulting firm (Offeror) must demonstrate experiences in activities similar as proposed in this proposal. Consulting firm must be legally registered as per the rule of Government of Nepal and provide the The following documents

1. Consulting/Company Registration Certificate
2. VAT Registration Certificate
3. 2076/77 Tax Clearance Certificate

### **iv. Human Resource Requirement**

The consulting firm shall propose a team as per necessity, comprising of at least the following professionals and support staff, to carry out the assigned tasks:

- **International Biogas Expert (Team Leader):** The Expert shall lead and provide key technical inputs in preparing the training manual and also act as the key resource person for conducting the training on operation and maintenance of CSTR-based large biogas/waste to energy projects. The incumbent should at least have a Master's Degree in the field of energy/environment/sanitation/waste management and more than 10 years' professional hands on experience in dealing with CSTR biogas technology. Experience in the Nepalese biogas sector would be an advantage.
- **Biogas Expert:** The incumbent shall support the team for preparation of manual and support during the training program. The incumbent should at least have a Master's Degree in the field of energy/environment/sanitation/waste management and at least 7 years' experience in the biogas sector in Nepal and possess prior experience in preparation of manuals and conduction of operation and maintenance training in the sector.
- **Training Facilitator:** The incumbent shall be responsible for facilitating smooth conduction of training program. S/he should at least have a Bachelor's degree in any discipline and have experience in conduction of similar trainings in the past.

Detailed CVs of all professionals to be involved in this assignment with clear demarcation of roles and responsibilities and their commitment to provide time for the intended services must be

submitted in the technical proposal **with their original signatures or individual letters of commitment**.

#### **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 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 thereto 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 3 months after signing the contract.

#### **15. Payment**

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

<b>Amount (%)</b>	<b>Payment</b>
20%	Upon submission of the Inception Report
30%	Upon submission of the Draft Training Manual
20%	Upon submission of the Draft Training Report
30%	Upon acceptance of the Final Training Completion Report

## 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 5544146, Fax: 01 5544576  
Website: <http://www.aepc.gov.np/rerl/public>  
Email: [rerl@aepc.gov.np](mailto:rerl@aepc.gov.np)

And,

Marked with:

**"Conducting Technical Training on Operation and Maintenance of Continuously Stirred Tank Reactor (CSTR) based Large Biogas/Waste to Energy Projects"**

- (ii) 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, 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 RERL at the address specified under clause *Sealing and Marking of Proposals* no later than **16:00 hrs, 14 December 2021**.

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 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 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**

RERL shall open the Proposals in the presence of RERL and UNDP representatives at the Project 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 in 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:

Lowest Bid Offered\*  
 ----- X 300

Bid of the Firm/Offeror

\* "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 Proposal

The Technical Proposal will be evaluated for a maximum of 700 points. The basis for the evaluation of the technical proposals is mentioned below.

Summary of technical proposal evaluation form	Score weight	Point obtainable
• Expertise of the consulting firm submitting the proposal	25%	175
• Methodology, its appropriateness, condition and timeliness of the implementation plan to carry out the proposed tasks	25%	175
• Qualification and experience of personnel	50%	350
<b>Total</b>		<b>700</b>

Note:

- Minimum 490 points out of the possible 700 points is required for being technically eligible
- 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

S.N	Criteria	Obtainable points	Company/Firm				
			A	B	C	D	E
1.	General Experiences of firm	30					
2.	Reputation of the organization – reliability	30					
3.	Experience on conducting O&M trainings on large biogas/waste to energy projects	45					
4.	Experience on conducting trainings on CSTR-based large biogas/waste to energy projects	70					
<b>Sub Total</b>		<b>175</b>					

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

S.N	Criteria	Obtainable points	Company/Firm				
			A	B	C	D	E
1.	To what degree does the Offeror understand the task	40					
2.	Is there sufficiency in the important aspects of the task been addressed in sufficient detail (clarity)	50					

3.	Time management and resource planning	60					
4.	Innovativeness in approach and methodology	25					
<b>Sub Total</b>		<b>175</b>					

**Form 3: Criteria for evaluation of proposed human resources**

Team Composition	Criteria	Obtainable points	Company/Firm				
			A	B	C	D	E
International Biogas Expert (Team Leader)	<ul style="list-style-type: none"> <li>Masters degree in the field of energy, environment, sanitation, waste management with substansive knowledge of biogas sector</li> </ul>	15					
	<ul style="list-style-type: none"> <li>At least 10 years' experience in CSTR-based biogas technology</li> </ul>	50					
	<ul style="list-style-type: none"> <li>Experience in providing relevant trainings on waste to energy and/or large biogas technology</li> </ul>	40					
	<ul style="list-style-type: none"> <li>Experience in training on O&amp;M of CSTR-based biogas projects</li> </ul>	80					
	<ul style="list-style-type: none"> <li>Experience in the Nepalese biogas sector</li> </ul>	15					
Biogas Expert	<ul style="list-style-type: none"> <li>Masters degree in the field of energy, environment, sanitation, waste management with substansive knowledge of biogas sector.</li> </ul>	10					
	<ul style="list-style-type: none"> <li>At least 7 years' experience in the biogas sector</li> </ul>	25					
	<ul style="list-style-type: none"> <li>Experience in providing relevant trainings</li> </ul>	25					
	<ul style="list-style-type: none"> <li>Experience in conduction of O&amp;M training in biogas</li> </ul>	40					
Training Facilitator	<ul style="list-style-type: none"> <li>At least a Bachelors degree</li> </ul>	5					
	<ul style="list-style-type: none"> <li>Experience in conducting training programs</li> </ul>	15					

	<ul style="list-style-type: none"> <li>• Specific experience in training in the biogas sector</li> </ul>	30					
<b>Total</b>		<b>350</b>					

**F. Award of contract**

**24. Award criteria, award of contract**

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, 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 7 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 AEPC/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 interfere, 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 5544146, Fax: 01 5544576  
Website: <http://www.aepc.gov.np/rerl/public>  
Email: [rerl@aepc.gov.np](mailto: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 "**Conducting Technical Training on Operation and Maintenance of Continuously Stirred Tank Reactor (CSTR) based Large Biogas/Waste to Energy Projects**" 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 alongwith 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).

**Table A. Cost Breakdown (*This is only an Example*)**

S.N.	Particulars	Quantity	Unit	Rate NRs	Amount NRs.
<b>A</b>	<b>Human Resource</b>				
1	International Biogas Expert (Team Leader)		MD		
2	Biogas Expert		MD		
3	Training Facilitator		MD		
<b>B</b>	<b>Travel cost and DSA</b>				
	.....				
<b>C</b>	<b>Administrative and Overhead Cost</b>				
	.....				
<b>D</b>	<b>Total (A +B+C)</b>				
<b>E</b>	<b>VAT (13%) of D</b>				
	<b>Total (D+E)</b>				

(Signature)

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

[Designation]

[Date]

(Office Stamp)



## Terms of Reference

### Conducting Technical Training on Operation and Maintenance of Continuous Stirred Tank Reactor (CSTR) based Large Biogas/Waste to Energy Projects

#### 1. Introduction

Nepal is also one of six pilot countries identified for assistance under the Scaling-up Renewable Energy Program in Low Income Countries (SREP) by the SREP sub-committee. As one of three programs under the Strategic Climate Fund, SREP aims to demonstrate social, economic and environmental viability of low carbon development pathways in the energy sector. In particular, the objectives of SREP in Nepal are to: (i) leverage complementary credit and grant co-financing, (ii) bring about transformational impacts through scaling up energy access using renewable energy technologies (RETs), poverty reduction, gender and social inclusiveness and climate change mitigation, and (iii) ensure sustainable operations through technical assistance and capacity building. The Government of Nepal (GoN) has designated the Ministry of Finance (MoF) and the Ministry of Energy, Water Resources and Irrigation (MoEWRI) as the focal points for SREP. MoEWRI has designated Alternative Energy Promotion Centre (AEPC) as the lead agency for SREP-related activities. The Waste to Energy under SREP is considered a sub-activity of renewable energy and hence the SREP-supported projects are part of the Government's program activity, and is being implemented by AEPC.

#### 2. Background

A continuous stirred tank reactor (CSTR) is a biogas reactor equipped with an impeller or other mixing device to provide efficient mixing. The name CSTR is often used to refer to an idealised agitated tank reactor used to model operation variables required to attain a specified output. CSTR equipped with features to continuously feed and exhaust reactants is an example of a mechanically mixed flow reactor. Amongst many advantages of CSTR plants over conventional models, the low hydraulic retention time (HRT) proved to be very useful. The low HRT allows large volumes of waste to be digested within smaller digester enclosure, minimizing the space requirements and increasing throughput.

With support from the World Bank, AEPC has been implementing SREP. AEPC has successfully commissioned more than six large scale CSTR plants and are in the process of installing more than 15 large scale biogas ranging from 3000 m<sup>3</sup> to 10,000 m<sup>3</sup>. Most of the installation companies are from abroad. Even though post-commissioning operation and maintenance (O&M) is done by the parent company, the O&M is eventually handed over to the Nepalese counterpart. In this aspect, it is essential that a pool of experts are available for O&M of large scale biogas plants. This shall enable Nepalese experts to independently solve any problems related to operation and maintenance of large biogas plants.

#### 3. Objectives

The specific objective of the assignment is to:

- Train 20 participants from private biogas developers who are currently operating large scale biogas or in the verge of completing CSTR plants in Nepal, who had received AEPC/World Bank grants.
- Propose and recommend way forward for promotion of large biogas plants under Waste to Energy component.

#### 4. Scope of work (activities)

- Prepare training curriculum and modules in close coordination with AEPC.
- Arrange and/or manage all necessary logistics for conducting the training smoothly.
  - Arrange all human resources required for the training program.
  - Prepare PowerPoint presentations for theory lectures and distribute hand-outs for each session.
  - In association with AEPC, arrange for a venue to conduct practical training for carrying out hands-on operation and maintenance of CSTR biogas plant.
  - Arrange logistics for the participants attending the training program including training hall, stationary (notebooks, pens, etc.), beamer and bags.
  - Arrange food and accommodation for the participants during the entire training duration.
  - Arrange transportation for participants to travel from the training hall to the designated construction site during practical sessions of the training.
  - In coordination with AEPC, arrange certificates for distribution to successful participants after the training.
- Smoothly conduct the training with particular focus on the following categories:
  - Weighing of substrate and problems related to weighing of input materials. Train participants on data acquisition related to mass balance for the input material.
  - Repair and maintenance of input pumps. Introduce participants to the types of semi-solid pumps, the problems associated with it and remedial measures in case of failure.
  - Removal of impellers, heat-exchangers, membranes and sensors of digester for CSTR plants including the problems associated during operation of the individual components and remedial measures.
  - Assess the effectiveness of technology choice, selection process, project design process including but not limited to, the suitability/appropriateness of the proposed anaerobic reactor design for treatment of a specific waste for large scale biogas developers in Nepal.
  - During training, share past experience of the technology (Reactor Design) for treatment of similar nature of waste and provide solutions for optimization.
  - Conduct the field visits to operational biogas (waste to energy) plants – combination of the ones generating bio-methane and electricity as the final outputs -- as advised by AEPC and assess the O&M processes & protocols and analyse the primary O&M process and requirements such as but not limited to, developer's O&M structures, spare parts requirements, plant safety/security, contractual arrangements with vendors, supply chain, feed preparation requirements, feed/catalyst/chemical storage requirements, waste water treatment, HSE requirements; reasonableness of gas/electricity outputs etc. and provide recommendations for improvement.

- Support in technology tie ups arrangements (in terms validity of know how transfer agreement, propriety equipment if any, capacity building of counterpart in Nepal, etc.)
- Prepare a training conduction report after the completion of training with key recommendations on the way forward for promotion of large biogas plants under Waste to Energy component.

## **5. Timeline and deliverables**

The key deliverables of the assignment along with the timeline of the assignment shall be as follows:

- An Inception Report (Training preparation report) within one week after signing the agreement
- A Draft Training Manual on operation and maintenance of CSTR biogas plant within three weeks after approval of the inception report by AEPC
- A Draft Training Report within one week of completion of the training for comments and feedback
- The Final Training Completion Report including training manuals (two printed copies and an e-copy) within one week of receiving consolidated comments, if any, on the draft training report

To the extent possible, AEPC shall provide written comments and feedback on the reports submitted by the Consultant within seven days.

## **6. Qualification of the consulting firm**

The consulting firm shall have prior experience in carrying out similar assignments in the past. The consulting firm shall, at least, possess the following:

- Should be a registered consulting firm
- Should have experience in providing consulting services in large biogas and waste to energy and conducting training for large biogas construction
- Should have demonstrated knowledge and practical experience on large biogas systems for waste to energy plants, specifically capable of providing hands on skills on large biogas installation

## **7. Duration**

The assignment, in totality, shall be completed within 3 (three) months from the date of contract agreement.