

Terms of Reference

Conducting Technical Training on Operation and Maintenance of 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/MGEAP) by the SREP/MGEAP sub-committee. As one of three programs under the Strategic Climate Fund, SREP/MGEAP aims to demonstrate social, economic and environmental viability of low carbon development pathways in the energy sector. In particular, the objectives of SREP/MGEAP 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/MGEAP. MoEWRI has designated Alternative Energy Promotion Centre (AEPC) as the lead agency for SREP/MGEAP-related activities. The Waste to Energy under SREP/MGEAP is considered a sub-activity of renewable energy and hence the SREP/MGEAP-supported projects are part of the Government's program activity, and is being implemented by AEPC.

2. Background

Most of the large plants in Nepal are based on continuous stirred tank reactor (CSTR). This 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. Biogas 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.

Similarly there are MIBR technologies also installed in Nepal. Microbe-induced batch reactors, also known as microbial batch reactors, are a type of bioreactor used for cultivating microorganisms under controlled conditions to carry out specific biological processes.

With support from the World Bank, AEPC has been implementing SREP/MGEAP. AEPC has successfully commissioned more than six large scale large biogas plants and are in the process of installing more than 15 large scale biogas ranging from 3000 m³ to 10,000 m³. 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 participants from private biogas developers who are currently operating large scale biogas or in the verge of completing large biogas 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 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 biogas plant.
 - Arrange logistics for the participants attending the training program including training hall, stationary (notebooks, pens, etc.), beamer and bags.
 - 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 large biogas 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.
- All necessary logistics such as food, accommodation and travel of participants shall be borne by AEPC.

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 biogas plant within three weeks after approval of the inception report by AEPC
- Conduction of training should be done within the seventh week of the specified period.
- 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 and Team Members

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

Team Members:

Three people are sought to conduct the training. Two international experts and one local training facilitator shall conduct the training. The qualifications of the team members should be as follows:

- **Team Leader (International) (One):** Mechanical, Civil or Environmental Engineer with at least Bachelor's Degree in the field of energy/environment/water and sanitation and more than **7 years' experience in designing and conduction of O&M of large biogas systems training programs in the past.**
- **International Biogas Expert (International) (One):** with at least Bachelor's Degree in the field of energy/environment/water and sanitation and more than **5 years professional hands on experience in dealing with biogas technology.** Experience in the Nepalese biogas sector would be an advantage.
- **Training expert (National) (One):** with at least Master's degree in any discipline and having experience of minimum 5 years and having experience on conduction of trainings on large biogas in the past.

7. Duration

The assignment, in totality, shall be completed within 2 (two) months from the date of contract agreement.



Information to the Consultants for preparation and submission of EOI

The interested consultants are requested to submit the Expression of Interest (EOI) for the **Conducting Technical Training on Operation and Maintenance of Large Biogas/Waste to Energy Projects**". This expression of interest is open to all eligible **Consulting firm/Company/Organization**.

1. A letter of interest duly signed by the authorized representative shall be addressed to:

**Project Director
Private Sector-Led Mini-Grid Energy Access Project (MGEAP)
Alternative Energy Promotion Centre (AEPC),
Mid-Baneshwor, Kathmandu, Bagmati Province, Nepal**

2. Eligibility criteria of the Consulting Firm

Eligibility of Consulting Firm will be as below:

- i) A Copy of Company/Firm Registration Certificate with updated renewal
- ii) A Copy of PAN/VAT Registration Certificate (For National Consultants)
- iii) A Copy of Tax Clearance Certificate or Evidence of Income Tax Return or Evidence of Time Extension for Income Tax Return of F.Y. 2079/80 (For National Consultants)
- iv) Self-Declaration (Regarding not blacklisted, not ineligible to participate in the contract and has not been punished in the business offence)



EOI Forms & Formats

1. Letter of Application

(Letterhead paper of the Applicant or partner responsible for a joint venture, including full postal address, telephone no., fax and email address)

Date:

To,

Full Name of Client: _____

Full Address of Client: _____

Telephone No.: _____

Email Address: _____

Sir/Madam,

1. Being duly authorized to represent and act on behalf of (hereinafter "the Applicant"), and having reviewed and fully understood all the short-listing information provided, the undersigned hereby apply to be short-listed by *[Insert name of Client]* as Consultant for *{Insert brief description of Work/Services}*.
2. Attached to this letter are photocopies of original documents defining:
 - a) the Applicant's legal status;
 - b) the principal place of business;
3. *[Insert name of Client]* and its authorized representatives are hereby authorized to verify the statements, documents, and information submitted in connection with this application. This Letter of Application will also serve as authorization to any individual or authorized representative of any institution referred to in the supporting information, to provide such information deemed necessary and requested by yourselves to verify statements and information provided in this application, or with regard to the resources, experience, and competence of the Applicant.
4. *[Insert name of Client]* and its authorized representatives are authorized to contact any of the signatories to this letter for any further information.¹
5. All further communication concerning this Application should be addressed to the following person,
[Person]
[Company]
[Address]
[Phone, Fax, Email]
6. We declare that, we have no conflict of interest in the proposed procurement proceedings and we have not been punished for an offense relating to the concerned profession or business and our Company/firm has not been declared ineligible.
7. We further confirm that, if any of our experts is engaged to prepare the TOR for any ensuing assignment resulting from our work product under this assignment, our firm, JV member or sub-consultant, and the expert(s) will be disqualified from short-listing and participation in the assignment.
8. The undersigned declares that the statements made and the information provided in the duly completed application are complete, true and correct in every detail.

Signed :

Name :

For and on behalf of (name of Applicant or partner of a joint venture):

¹ Applications by joint ventures should provide on a separate sheet, relevant information for each party to the Application.



2. Applicant's Information Form

(In case of joint venture of two or more firms to be filled separately for each constituent member)

1. Name of Firm/Company:
2. Type of Constitution (*Partnership/ Pvt. Ltd/Public Ltd/ Public Sector/ NGO*)
3. Date of Registration / Commencement of Business (*Please specify*):
4. Country of Registration:
5. Registered Office/Place of Business:
6. Telephone No; Fax No; E-Mail Address
7. Name of Authorized Contact Person / Designation/ Address/Telephone:
8. Name of Authorized Local Agent /Address/Telephone:
9. Consultant's Organization:
10. Total number of staff:
11. Number of regular professional staff:

(Provide Company Profile with description of the background and organization of the Consultant and, if applicable, for each joint venture partner for this assignment.)

3. Experience:

3(A). General Work Experience:

(Details of assignments undertaken. Each consultant or member of a JV must fill in this form.)

S. N.	Name of assignment	Location	Value of Contract	Year Completed	Client	Description of work carried out
1.						
2.						
3.						
4.						
5.						
6.						
7.						

3(B). Specific Experience:

Details of similar assignments undertaken in the previous Ten years

(In case of joint venture of two or more firms to be filled separately for each constituent member)

Assignment name:	Approx. value of the contract (in current NRs; US\$ or Euro) ² :
Country: Location within country:	Duration of assignment (months):
Name of Client:	Total No. of person-months of the assignment:
Address:	Approx. value of the services provided by your firm under the contract (in current NRs; US\$ or Euro):
Start date (month/year): Completion date (month/year):	No. of professional person-months provided by the joint venture partners or the Sub-Consultants:
Name of joint venture partner or sub-Consultants, if any:	Narrative description of Project:
Description of actual services provided in the assignment:	

Firm's Name: _____

² Consultant should state value in the currency as mentioned in the contract

4. Technical and Managerial Capacity:

Published Notice in the Kantipur National Daily of 5 February 2024



Government of Nepal

Ministry of Energy, Water Resources and Irrigation

Alternative Energy Promotion Centre (AEPC)

Private Sector-Led Mini-Grid Energy Access Project (MGEAP)

Mid-Baneshwor, Kathmandu, Nepal

Tel: +977-1-4598013/4598014

Email: info@aepec.gov.np Website: www.aepec.gov.np

REQUEST FOR EXPRESSION OF INTEREST (REOI)

Consultancy Services for "Conducting Technical Training on Operation and Maintenance of Large Biogas/Waste-to-Energy Projects"

Contract ID (STEP Ref.) No.: NP-AEPC-333003-CS-CQS

Project ID Number: P149239, World Bank SCF Grants Number: TFoA8382

Date of Notice Publication: 5 February 2024

1. The Government of Nepal has received financing from the World Bank toward the cost of the **Private Sector-Led Mini-Grid Energy Access Project (MGEAP)**, and intends to apply part of the proceeds for the procurement of Consulting Services.
2. The Consulting Services ("the Services") include **Conducting Technical Training on Operation and Maintenance of Large Biogas/Waste-to-Energy Projects**. An estimated input of key experts is 55 person days. The total duration of the consultancy services will be **2 months** and the expected start date of the assignment is **15 March 2024**.
3. The detailed Terms of Reference (ToR) for the assignment and Expression of Interest (EoI) submission procedure can be obtained from the website of AEPC: www.aepec.gov.np or the office of the AEPC, at the address mentioned above.
4. The AEPC/MGEAP now invites eligible consulting firms ("Consultants") to indicate their interest in providing the services. Interested consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services. The shortlisting criteria are:
 - a. General work experience within the last 10 years
 - b. Specific work experience within the last 10 years
 - c. Technical and Managerial capacity of Consulting FirmKey Experts will not be evaluated at the shortlisting stage.
5. The attention of interested Consultants is drawn to Section III, paragraphs 3.14, 3.16 and 3.17 of the World Bank's "Procurement Regulations for IPF Borrowers", July 2016 (5th Edition, September 2023) "Procurement Regulations", setting forth the World Bank's policy of conflict of interest.
6. Consultants may associate with other firms to enhance their qualifications but should indicate clearly whether the association is in the form of a joint venture and/or a sub-consultancy. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected.
7. A Consultant will be selected in accordance with the **Consultants Qualifications-based Selection (CQS)** method set out in the Procurement Regulations.
8. Further information can be obtained from the AEPC, at the address mentioned above during office hours.
9. Expression of Interest (EoI) must be delivered in a written form to the AEPC, at the address mentioned above in person, or by mail, or by email on or before **13:00 Hours Local Time on 23 February 2024**.
10. The eligible Consultants are encouraged to express their interest in the **"Conducting Technical Training on Operation and Maintenance of Large Biogas/Waste-to-Energy Projects"** advertised by the office of AEPC/MGEAP located at Mid-Baneshwar, Kathmandu, Nepal.