Terms of reference (ToR)

for a consultancy to assess the feasibility of Institutional Biogas from Waste Water Treatment Plant as Business Showcase in Adama Science and Technology University.

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Contents

General information

a. Brief information on the project

The GIZ Energy Programme Ethiopia (GIZ EPE), through its current five projects, namely the Energising Development (EnDev), the Green Peoples Energy (GBE), Energy Solutions for Displacement Settings (ESDS), Ethiopia-German Energy Cooperation/Partnership (EGEC), and Thematic Development Component that works jointly with and supports the Ministry of Water, Irrigation and Energy (MoWIE) in promoting energy access to households, SMEs, institutions and other social services in the rural areas including in refugee settings, and as well providing all rounded sector development support that include support in policy and regulatory development, as well as technical and institutional capacity building to the energy sector of Ethiopia.

Thematic Development Component of EPE is a component that focuses on new project ideas that could be developed into projects after necessary assessment are done. Furthermore, there is a good culture of complementarity among various GIZ Ethiopia Projects via internal commission of works.

It was with this background that GIZ International Services, approached GIZ- Ethiopia EPE to provide technical advice on Waste Water Treatment Plant built in 13 Universities in Ethiopia and operational in the last five years. The Waste Water Treatment Plant in Adama Science and Technology University is one of these. This waste water treatment plant has been properly managed and operationalized so far. So due to its proximity it is selected for assessment of feasibility of biogas from waste treatment plant. By so doing, the feasibility study will also be used as business showcase in 13 Universities where the same infrastructure was constructed so far and eight additional Universities that have planned to construct the waste water treatment plant. If found out to be feasible, the institutional biogas business case is hoped to

attract the private sector companies interested to work in this area. So far, Waste Water Treatment plant was designed, constructed and being operationalized for treatment of waste water. With the structures in place, experts advised that there is room to generate biogas from the waste water treatment.

b. Context

The objective of this feasibility study is to ascertain or reject this claim of experts by thoroughly investigate the necessary aspects of feasibility. There is need for a more structured field research to document and assess the technical and organizational set-up of the waste water treatment plants, propose technical aspects and organizational readiness and ownership of the proposed biogas energy produced. In a nutshell, the assessment should examine all aspects of the feasibility of the project and put forward pertinent recommendation thereof.

c. GIZ EPE, therefore, aims to tender out this work to qualified experts/consulting firm. The assignment shall be assumed to start in June 2021 and the final report submitted by July 2021.

d. The contractor shall provide the following work/service

d.1 Location of the assignment

The project site is located in Oromia Regional State, East Shewa Zone, Adama Town, Adama Science and Technology University Compound, at a distance of 75 Km East of Addis Ababa on the Ethio-Djibouti Highway. The site could be accessed via an express road running from Addis Ababa to Adama.

d.2. Scope of works

The Consultant will conduct field observation at the Waste Treatment site in Adama Science and Technology University, assess the technical aspect of the treatment plant and evaluate its relevance for biogas production, output of the plant, look into the organizational aspect by holding discussion with the administration of the University to examine the readiness, ownership affordability, demand and other pertinent aspects of biogas energy. In addition to that, the Consultant will assess current energy consumption for cooking by the University. Furthermore, the consultant will conduct economic analysis, financial analysis, gender perspective of the project and environmental analysis in terms of reduction of GHG emission.

d.3. Description of works

Technical Feasibility:

- Measure the amount and type of inputs into Imhoff tank and evaluate their relevance in the production of biogas
- Measure the amount and types of gases being produced and released into the atmosphere via 16 gas release pipes installed on the top of Imhoff tank.
- Examine the proportion of gases released via gas release pipes in generation of biogas.
- Quantify the amount of biogas that can be produced with in a day considering the variation in amount of inputs (measured or estimated)
- Is generation of biogas from the waste water treatment plant technically feasible? What structures need to be built? What is the engineering estimate of these components?
- What is needed for operation and management of the biogas system if it built?
- What is the average amount of energy that could be generated from the 16 gas release pipes? (measured or estimated)
- Quantify the electricity that could be generated from biogas plant.
- Propose the technologies or tools needed to generate electricity from the proposed biogas plant.

Environmental and Social Feasibility

- What is the amount of greenhouse gases being release into the atmosphere from the treatment plant now? (measured or estimated)
- What are the environmental cost, if any and potential benefits of the project, from the point of view of the environment?
- Is the project environmentally friendly? How?
- What are the health problems that are associated with indoor pollution that resulted from cooking in the University?
- Is the project socially acceptable?

Institutional Feasibility

- What is the readiness and willingness of the ASTU to use the gas produced for cooking? Discuss with the university management to figure out their expectation and willingness to use it
- What proportion of the cooking energy demand of the University could the biogas cover, if it is developed?

Financial and Eonomical Feasibility

- What could be the investment cost needed to develop or generate biogas from the waste treatment plant? Is the project financially feasible?
- What are the economic benefits and cost of the project? Is the project economic viable?

Gender Mainstreaming

- In light of gender mainstreaming, what will be the benefits of the project for female? To what extent it reduces the amount of indoor air pollution? How it will benefit women who are employed in cooking in the University? What is the number of staffs engaged in cooking in the University? What percent of them is women?

d.4. Deliverables

The following is to be developed and submitted:

- An inception report to agree on the site visit mission and concept proposed by the Consultant including timeline, report template, structure, list of data to verify etc.
- A technical assessment report with detailed description of- and answers to the above-mentioned issues and questions as well as recommendations for developing biogas technology on the waste water treatment plant. Photos, sketches and drawings to be included.
- Adama Science and Technology University (ASTU) need assessment report with detailed description of- and answers to the above-mentioned issues and questions as well as recommendations for development and utilization of the biogas to be developed.
- As assessment of the energy consumption of ASTU for cooking purpose and technology options to enhance biogas for cooking and recommendations
- A report on social responsibilities and cross-cutting issues, with a detailed description of- and answers to the above-mentioned issues and questions.

Certain milestones, as laid out in the table below, are to be achieved by certain dates during the contract duration:

SN	Activities	June, 2021	June, 2021	June, 2021	June ,2021	July 2021	July, 2021
1	Award contract						
2	Submission of inception report						
3	Kick-off meeting in Addis						
4	Site visits						
5	Draft report						
6	Approved final report						

Vehicle Cost: GIZ EPE will provide for a field car with driver to transport the Consultant from Addis Ababa to Adama and Adama to Addis Ababa, as well as during the field mission. Therefore, field viecle cost should not be included in the price offer.

Tender requirements

1. Qualifications of proposed staff

1.1 Expert 1: Lead Consultant

1.1.1 General qualifications

A national senior biogas expert with extensive technical development and implementation experience of Institutional Biogas.

1.1.2 Experience in the region/knowledge of the country: Work and research experience in Oromia region

1.1.3 Language skills: business fluency in English and Afan Oromo

1.2 Expert 2: National expert

1.2.1 General qualifications

One national expert in renewable energy technologies, outstandingly, in biogas technology management, with proven field experience of at least 5 years preferably in the energy or economic development area.

1.2.2 Experience in the region/knowledge of the country: Work experience in Oromia

1.2.3 Language skills: business fluency in English and Afan Oromo

1.3 Expert 3: National expert

1.3.1 General qualifications

One national expert in energy technologies in Ethiopia with proven work experience in biogas technology preferably in institutional biogas technology.

1.3.2 Experience in the region/knowledge of the country: Work experience in Oromia

1.3.3 Language skills: business fluency in English and Afan Oromo

CVs for all the three experts to be included in the bidding documents

2. Appropriateness of proposed concept

The bidder should fill in the attached price sheet (**financial offer)**, and submit it together with a clearly separated **technical offer** on when and how the task will be implemented.

Further, information on bidding company and bank details are required. Omitting to submit information could disqualify the bidder.

The financial offer will only be considered if the assessment of technical description is acceptable.

The technical description should base on the description of works and deliverables and at least contain (not limited to):

- Company profile (history, organizational setup, track record, contact details)
- Appropriateness of suggested concept and work plan
    - A work/mission plan reflecting full understanding of the tasks and objective.
    - Description of the technical concept, alternative concept if deemed necessary.
    - A description on how the processes will be managed and monitored during the assignment.
    - Time schedule.
- Technical implementation, backstopping and management capacities
    - CV of the lead-consultant, and his/her experience with feasibility study of institutional biogas technologies using waste water treatment. The lead-consultant must be a senior expert with at least 10 years of experience in design of biogas technologies outstandingly institutional plants from waste water treatment.
    - Attach references for top assignments on feasibility study of institutional biogas technologies using waste water treatment

- Qualification of proposed supporting consultants
    - CVs of supporting consultants, outlining how their qualifications match the assignment.
    - Submit work references on feasibility study of institutional Biogas technology
    - Short description of specific knowledge from the east African region and specifically Ethiopia.

3. Specification of inputs

Fee days	**Number of experts**	**Number of days per expert**	**Comments**
• Preparation/debriefing	3	1	
• Field trip	3	6	
• Reporting	2	7	
Travel expenses	**Number of experts**	**Number of days/nights per experts**	**Comments**
• Per-diem allowance in country of assignment	3	6	
• Overnight allowance in country of assignment	3	6	
• Travel costs (rented / private vehicle)			
Flights	**Number of experts**	**Number of flights per experts**	**Comments**
•			
Other costs	**Number of experts**	**Amount per experts**	**Comments**

Calculate your financial bid exactly *in line with the quantitative requirements of the specification of inputs above. There is no contractual right to use up the full days/travel or workshops or budgets. The number of days/travel/workshops and the budgets will be contractually agreed as* ***maximum amounts****. The regulations on pricing are contained in the price sheet.*

Note:

If restrictions are introduced to combat coronavirus/COVID-19 (restrictions on air travel and travel in general, entry restrictions, quarantine measures, etc.), GIZ and the contractor are obliged to make adjustments to their contractual services to reflect the changed circumstances on the basis of good faith; this may involve changes to the service delivery period, the services to be delivered and, if necessary, to the remuneration.

ANNEX

Imhoff structure