



AUA ACOPIAN CENTER
for the ENVIRONMENT



Request for Proposals

for

Pre-feasibility Study on Biogas Infrastructure Development in Armenia

Waste Policy Armenia
4-year program funded by Sweden

Organization: American University of Armenia (AUA)

Assignment start date: July, 2024

Assignment end date: Oct, 2024

Location: Armenia

Tender Name: Pre-feasibility Study on Biogas Infrastructure Development in Armenia

Tender submission deadline: June 17, 2024

May 2024



1. Tender Information

1.1. Introduction

American University of Armenia (AUA) is pleased to announce the release of this tender opportunity and Request for Proposal (RFP) for a pre-feasibility study on biogas infrastructure development in Armenia. We invite qualified and experienced consultants, contractors, and suppliers hereinafter referred to as the “Proponent”, to participate in this competitive bidding process and submit proposals in accordance with the requirements of this RFP. This Tender is conducted in the framework of the Waste Policy Armenia 4-year program funded by Sweden and implemented by the American University of Armenia (AUA) Acopian Center for the Environment. The Program’s overall goal is to improve Armenia’s capacity to implement more environmentally sound waste management policies.

For more information please visit the Program webpage https://ace.aua.am/projects/waste_policy/.

AUA at its sole discretion intends to select and award this tender to the best qualified Proponent, based on the criteria outlined herein but not limited to the following:

- Qualifications and experience in the relevant fields of Biomass Feedstock based Biogas generation, suitable for pipeline quality Renewable Natural Gas (RNG), power generation and transportation (CNG)
- Project Team resources and key personnel experience proposed for this pre-feasibility study
- Project Execution Plan and Technical Approach
- Competitive Cost Proposal.

Proposal selection and award will be based on Qualitative (Technical) + Quantitative (Commercial) Score Points method. Proposals will be evaluated on the basis of their responsiveness to this RFP, applying score points to the evaluation criteria. Each proposal will be given a Technical Score with maximum award points=100 and a Commercial Score with maximum award points=100 as outlined in Appendix D.

Proponent’s $Final\ Score\ Qualitative + Quantitative = Technical\ Score \times 0.55\ Weight\ Factor + Commercial\ Score \times 0.45\ Weight\ Factor$ and ranked accordingly from highest to the lowest overall score points.

1.2. Electronic Tenders shall be submitted to

Tenders should be submitted to tender@aua.am

All correspondence, technical and commercial questions pertaining to this tender shall be sent electronically to the following email address: wpa.bid@aua.am

Contact person: Karen Hambardzumyan

1.3. Pre-Tender Conference

Online pre-bid conference will be held at 11.00 AMT (GMT+4), on May 31, 2024. Attendance is optional. An online meeting invitation will be sent to all Proponents.

1.4. The schedule

- The schedule for this Tender and RFP process as well as the overall pre-feasibility study is outlined below. The schedule is subject to revisions and AUA reserves the right at its sole discretion, to modify the schedule as deemed to be necessary:

Activity Milestone	Date
Issue Tender and RFP Document	May 20, 2024
Pre-Bid Conference Remote Meeting	May 31, 2024
Submission of RFP Questions Deadline	June 4, 2024
Proposal Submission Opening Date	June 10, 2024
Proposal Submission Due Date at [23:59 AMT Yerevan time]	June 17, 2024
Pre-award online interviews with finalists	June 28, 2024
Estimated bid award day	July 8, 2024
Online inception meeting	July 22, 2024
On-site field visits	Aug 19, 2024 (or TBD)
Interim mid-term progress presentation by one expert (in person in Yerevan)	Mid-September, 2024 (or TBD)
Pre-feasibility Study Completion and Final Presentation (in person, in Yerevan)	Nov 15, 2024

1.5. General Requirements

AUA may consider non-responsive any Tender not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all Proposals. Bid proposals shall remain valid for one hundred twenty (120) days after the actual date of receiving thereof. AUA, at its sole discretion, may elect to accept and award the entire Tender Proposal or defer/delete Scope Items from the Scope of Work as outlined in this Tender.

1.6. Proposal and Tender Submittal Requirements

Proponents are required to submit all documents, including the Tender Forms and all other Proposal Submittal requirements in support of the Tender.

All forms must be legibly and clearly filled out. Incomplete forms and technical information will result in the Tender Proposal to be deemed as “Non-Responsive” and may not be considered for award.

2. Background

2.1. Government Priorities and Current Initiatives

Given the recent interest and active engagement of the Armenian government and its intention to build capacities in the country for improved biowaste management, the AUA Acopian Center for the Environment and AUA EPIC are exploring ways to support the government, esp., by commissioning a **pre-feasibility study** on biogas infrastructure development in Armenia. Several key governmental

stakeholders have indicated a need for such a study and readiness to support it. The consultations with the industry stakeholders show that the demand for bio-waste reprocessing and biogas production has grown, specifically among dairy producers.

The immediate implications for implementing the recommendations from such a pre-feasibility study would be clear incentives for investments in waste management and energy sectors. Additionally, the pre-feasibility study will contribute to improved policies on organic waste management, including CEPA requirements on addressing issues of biodegradable municipal waste going to landfills.

2.2. Environmental Impacts

Animal husbandry is an important contributor to rural income generation and value-added, contributing to 40% of agricultural gross domestic product. For example, there are an estimated 677,000 head of cattle in Armenia. Particular concentrations of cattle exist in Gegharkunik and Syunik provinces. It is estimated that Armenia's cows could be producing 6-8 million tons of manure per year on average. The dumping of manure from small-scale farms, in particular, results in harm to water supplies. Nitrogen, phosphorus, and pathogens are the most common water pollutants from manure on farms. The dumping of manure also represents lost value, as manure has many uses that can be employed to address and bolster against multidimensional poverty.

2.3. Regulatory Aspects

Although manure is considered having 4-th class of hazard according to the list of hazardous wastes, the existing regulations on hazardous waste management are not enforced when it comes to manure management. Among the main reasons are the lack of information and capacity to control the farming operations, poor knowledge of good practices, lack of incentives, and most importantly poor infrastructure for environmentally sound treatment of manure and organic agricultural wastes.

2.4. Market and End-Use Aspects

The manure is increasingly being utilized as a substitute for wood fuel, particularly for households reliant on solid fuel-based heating systems. During the heating season, an estimated 90,000 tons of manure are traded, processed into dry solid fuel, and sold at an average price of \$5 per ton, generating a total revenue of around 0.45 million USD. However, there is a growing trend among dairy producers and cattle breeders with herds exceeding 2,000 heads to explore anaerobic digestion (biogas production) as an alternative method for managing cattle manure, which typically averages 10 tons per head annually.

3. Objectives of the Study

The overall goal of this Pre-feasibility study is to determine the technical, economic, and environmental feasibility of developing Biomass feedstock supply streams, construction, and operation of anaerobic digester Biogas generation facilities, and the viability of introducing a biogas-based network and infrastructure in Armenia; suitable for power generation, and transportation fuel. Additionally, other value-added products and services should be identified (e.g., fertilizer, better soil and water resource management outcomes, etc.)

4. Scope of Work

The Scope of Work outlined in this section describes the minimum requirements to perform and deliver the Biogas Pre-feasibility study. Proponents may offer additional tasks, technologies, and scope items as deemed necessary to achieve the overall Objectives and Goal for this study.

4.1. Defining National-Level Background and Scope

Inter alia, this may include field visits, interviews, and meetings with key actors. The list of stakeholders should include but not be limited to local Subject Matter Experts(SMEs), in relevant sectors such as agriculture, waste management, and industry; government authorities, primarily including the Ministry of Economy, Ministry of Environment, Ministry of Territorial Administration and Infrastructure; local and territorial administration authorities; major feedstock generators such as animal farms, dairy producers; major potential off-taker customer segments for biogas (e.g. gas grid, natural gas stations, power plants, etc.); major potential customer segments for biofertilizer (e.g. exporters, agricultural farmers, etc.); and others.

4.2. Identification of Framework Conditions and Revenue Streams

This includes assessing existing economic incentives, potential markets for biogas (e.g. transportation, energy market, and others), taxes, price projections, and non-economic incentives (e.g. fertilizer logistics and storage, etc.). Regulation for digestate and manure land use, site permitting regulations. The task should include the identification of existing regulatory drawbacks and bottlenecks.

4.3. Resource Assessment

This includes market analysis based on a mapping of various types of feedstocks and their associated content, quantity, and quality, heating values (HHV and LHV) for Methane (CH₄) and Carbon Dioxide (CO₂) generation potentials from various sectors. The GIS/remote mapping is a preferable tool.

4.4. Identification of National-Scale Model and Constraints

This includes the identification of a recommended model of Biogas generation and distribution. Centralized, cluster-based, or other approach should be justified.

4.5. Technical Evaluation

This includes the sizing of a typical plant(s) adapted to the local in Armenia, including the conceptual design of an anaerobic digester plant as the basic case and two (2) add-on options. For the technical evaluation, the Proponent shall prepare a technical approach and definitions for the Base Case (Option 0) and Alternative Cases 1 & 2. The consultant shall conduct technical assessment for pipeline quality RNG production, biogas cleanup, and injection methods to the existing pipeline grid as well as CO₂ sequestration technologies

4.6. Financial Evaluation

Financial Evaluation should include CAPEX, OPEX, Revenues, and Profits, among other parameters. The recommended approach shall forecast a 25-year Pro Forma and Net Present Value Model for each case, taking into account the initial projected CapEx and OpEx as well as the Revenue Streams from Tipping Fees, Biogas, and CO2 Commodity Sale.

4.7. Business Case Preparation

Economic evaluation of various business opportunities for CNG production to gas off-take. The transportation sector should be considered (CNG cars, heavy vehicles, etc.) followed by other options for electricity production. Industrial synergies such as use of the biogas and carbon dioxide in greenhouse and other operations. This task should include a detailed description of the value chain as well as sensitivity analysis.

Business Case RiP will need to incorporate a dedicated section focused on the bankability assessment of the proposed options for biogas infrastructure development. This section should delve into the financial viability, risk factors, and potential returns associated with each option, thereby providing crucial insights for stakeholders and decision-makers. Evaluating the bankability of these options should not only facilitate informed decision-making but also serve as a pivotal aspect in securing funding and investment opportunities essential for the successful implementation of the biogas projects in Armenia.

4.8. Environmental And Social Impact Compliance Assessment

This task includes a description of how the proposed model will comply with national and EU standards of health and environmental protection as well as comply with the best available techniques. The assessment should address the key stakeholder feedback, including current challenges of handling manure and agri-waste dumping, inefficient methods of using manure as fertilizer (unintended consequences of over-fertilization, soil damage, etc.) or solid fuel, and environmental benefits of CO2 capture and sequestration with a potential revenue stream for industrial applications.

Also prepare an estimation and quantification of the fugitive methane and Greenhouse Gas (GHG) emissions resulting from current practice methods handling Biomass. The estimation shall include manure and other agricultural waste streams that may be otherwise captured and avoided with the implementation of a National Policy for the utilization of Biomass for Biogas production. Demonstrate analytically the benefits of the same for Armenia's overall carbon footprint reduction in terms of tons/year of GHGs (CO2) as well as additional hectares of flora and fauna within Armenia's landscape, that will be required to capture the equivalent quantities of CO2 emissions annually.

4.9. Risk Assessment

Assessment of potential risks as financial, regulatory, and political instability risks and description of certain mitigation measures

4.10. Identification of Necessary Policy Improvements

This task includes a description of the recommended policy reforms that would create an enabling environment for a more sustainable value chain in the relevant sectors.

5. Project Deliverables

- A. Project Execution Plan and Inception report including content outlined in Section 6.2.a of this RFP. The updated Project Execution Plan shall be presented to AUA at the Online inception meeting (on July 1, 2024).
- B. Weekly progress updates and review meetings (Remote).
- C. Interim mid-term progress presentation by one expert (in person in Yerevan, in early September).
- D. Pre-feasibility Study Completion and Final Presentation (In Person, in Yerevan, on Oct 15, 2024).
- E. Final Report format and content (not later than Oct 30, 2024).

Upon completion of the tasks outlined in Section 4.0, the pre-feasibility Report in A3 landscape format shall be prepared and at a minimum will contain the following sections:

- Report cover sheet
- Revision history and QA/QC sign-off block
- Acknowledgments
- Executive Summary and Recommendations
- Codes, Standards, and Guidelines
- Narrative descriptions, technical and financial analysis, area maps, tables and charts, process flow diagrams for Scope of Work Items 4.1 through 4.10
- Appendix section for backup materials, analysis, and calculations.

6. Tender Proposal Submission Requirements

6.1. Terms of Tender Proposal Submission

The Tender Proposal including the outlined required information shall be submitted on or before the 7th of June, 2024 via email tender@aua.am.

6.2. Tender Proposal structure

The submitted Tender Proposal shall have the following structure and sections among others:

1. Cover Letter
2. Executive Summary

3. Introduction
4. Project Execution Plan
 - a. Submit a concise description of the Proponent's approach for the execution of this Pre-feasibility study. The proposed Execution Plan shall describe the overall project team roles and responsibilities, including an organization chart, names of the key staff as well as sub-consultants/subcontractors, and other resources proposed to be deployed from the Proponent's country of origin as well in Armenia.
 - b. Clear delineation of project deliverables (including TOC of the Final Report).
 - c. Milestones and timelines. Timeline schedule for each task and activity, as well as the overall duration starting from the kick-off meeting to the delivery of the final report. The schedule should be high level (i.e. weeks) and indicate how many weeks are being allowed for each task.
 - d. Provide a high-level work breakdown structure, delineating each task with duration/timeline, and major milestones, client presentations and meetings, interim and final deliverables.
 - e. Description of the communication and reporting processes that will be used to keep AUA informed. Also, the deliverables shall include progress meetings in-person and remote, interim progress reports, and presentations at each milestone.)
 - f. Identification of risk management and mitigation strategies, and contingency plans.
5. Technical Approach
 - a. Submit a concise description of the proposed methodology and the technical approach for completing the study Scope of Work outlined in items 4.1 through 4.10.
 - b. Explanation of the technical expertise, tools, and resources that will be utilized.
 - c. List of expected local support and logistics to be provided for them (i.e., local experts, government officials, municipal authorities, sources of feedstock suppliers and offtake customers, etc.). Types and modalities of interactions should be indicated.

The local support will be provided by AUA's Acopian Center for the Environment. The costs associated with the local support should not be included in the budget. However, a detailed scope of local support should be provided, including tasks, experts and workload in person-days. For more details see Appendix C.
 - d. Specification of any assumptions, clarifications, and/or limitations that may impact the scope of work.
6. Firm Description
 - a. The Proponent shall describe its Firm and company background information as well as background information for all sub-consultants, subcontractors, and other resources included in the Proponent's project team. The following minimum information shall be provided:
 - Name of company, if a joint venture, name of joint venture, and names of individual companies comprising the joint venture. A copy of the joint venture agreement shall be included.
 - Address of corporate headquarters and participating branch office(s), if different.

- Form of company (i.e., sole proprietor, partnership, corporation, etc.).
- Date company formed and/or date of incorporation.
- Company principals include the president, chairman, vice president, secretary, chief operation officer, chief financial officer, and general manager(s).

7. Qualifications and Experience

- a. The Proponent shall demonstrate and submit evidence of successful experience, providing the outlined Scope of Work and services as well as technologies that may be considered for this pre-feasibility study. The minimum qualification and experience criteria are outlined herein:

b. Firm Minimum Qualifications:

Minimum of seven (7) years of successful practice and direct experience in the field of Renewable Energy with anaerobic digestion technology for Biogas production with Biomass feedstock, feedstock collection, and processing facilities, Biogas processing and cleanup, pipeline quality RNG production and injection, power generation, CNG transportation fuel, social and environmental impact assessment, regulatory and market assessment, financial modeling and development of viable business cases.

c. Key Personnel

Description of key personnel assigned to this project, including their qualifications and expertise. Submit work experience, and resumes (CVs) of all Key Personnel proposed for this Tender.

d. Key Local Personnel

The Proponent submits the list of the following key local personnel needed for the execution of the Scope of Work. The local support will be provided by AUA's Acopian Center for the Environment in accordance with the agreed list of necessary local personnel.

e. Project Experience:

Submit a minimum of three (3) projects relevant to the Scope of Work and services outlined in this RFP, completed by the Proponent and its Key Personnel, within the past five (5) years. The projects should be submitted as **Appendix D**. Provide the following information for each Project Experience:

- Project Name
- Project Location
- Year Completed
- Description of Project Type, Biogas Production Quality and Quantity
- Description of Services provided by the Proponent
- Proponent Key Personnel on this project including roles and responsibilities
- Current Status of the Project



- Project References including Owner/Client Name, Contact information, email, and physical address.
- f. Documentation of any necessary licenses, certifications, or accreditations (if available)
- 8. Commercial Proposal
 - a. A Lump Sum Fixed Fee Bid inclusive of all costs for sub-consultants/subcontractors, travel, lodging, taxes, and VAT shall be submitted.
 - b. Proponents are required to submit Appendix A Form of Bid
 - c. Submit a detailed cost breakdown of the proposed fee in accordance with the Appendix A Form of Bid, Fee and Cost Breakdown Table and Task Fee Breakdown Table:
 - d. Submit Schedule of Rates in accordance with Appendix B Schedule of Rates and Expenses Tables
 - e. Submit Appendix C Key Personnel Table
 - f. Execute and Return the NDA [if required]
 - g. Explanation of assumptions, clarifications, and exceptions.
- 9. Appendix to Tender
 - a. Supporting documents, examples of past work, case studies, and additional references.
 - b. Any other relevant information that strengthens the Proponents submitted proposal.

7. Appendix to RfP

APPENDIX - A FORM OF BID

NAME OF CONTRACT: [insert name]

TO:

American University of Armenian

Acopian Center for Environment

Yerevan, Armenia

We have examined the Terms of Reference for the Pre-feasibility Study on Biogas Infrastructure Development in Armenia. We accordingly submit herewith our Bid proposal to provide the requested services in conformity with such documents and as stated herein (including this Form of Tender) for the prices set out in our Bid.

Bid amount for Pre-feasibility Study :

Euros _____ (words)

€ _____ (figures)

Pre-Feasibility Study Fee and Cost Table		
Item No	Description	Fee Euros (€)
1	Proponent (Prime)	
2	Subconsultant/Subcontractor No-1	
3	Subconsultant/Subcontractor No-2	
4	Subconsultant/Subcontractor No-3	
5	Subconsultant/Subcontractor No-4	
6	Expenses	
Total Lump Sum Fee (Items 1 through 9)		



Pre-Feasibility Study Scope and Task Fee Breakdown Table		
Task No	Description	Fee Euros (€)
1	Defining national level background and scope	
2	Identification of framework conditions and revenue streams	
3	Resource assessment	
4	Identification of national-scale model and constraints	
5	Technical evaluation	
6	Financial Evaluation	
7	Business case preparation	
8	Environmental and social impact compliance assessment	
9	Risk assessment	
10	Identification of necessary policy improvements	
11	Meetings and Presentations	

We agree to abide by this Tender for 120 business days from the date of the Tender offer, and it shall remain binding upon us and may be accepted at any time before that date.

If this Bid Proposal is accepted, we will provide any additional supporting documents that may be requested by AUA, commence the services immediately after the Commencement Date, and complete the outlined Scope of Work in accordance with the above-named documents within the Time for Completion stated in our proposal.

Signature in the capacity of duly authorized to sign Bid for and on behalf of

[NAME AND ADDRESS]

Date: _____ day of _____ 20____

Signature: _____

Name and Title: _____

Witnessed By:

Name: _____

Signature: _____

Date: _____ day of _____ 20____

**APPENDIX B
SCHEDULE OF RATES**

The Proponent submits this Schedule of Rates for all staff and personnel in the home office as well as in Armenia, assigned to the project and the performance of the Scope of Work. The Schedule of Rates shall be fully inclusive of all fringe benefits, direct or indirect costs and expenses, profits, and overheads, taxes and VAT.

Schedule of Rates shall be in the following format:

A. Schedule of Rates for Staff and Personnel

No.	Description of Role/Responsibility/Job Function	Staff Work Location	Hourly Rates(€)	Daily Rate(€)

B. Schedule of Rates for Expenses

Item No.	Expense Item Description	A Unit Cost(€)	B ¹ Mark-Up(€)	C=A+B Total Cost (€)
			0	
			0	
			0	
			0	

Note 1: Expense costs shall be direct pass-through and Mark-up on expenses shall not be allowed

Date: _____ day of _____ 20__

Signature: _____

Name and Title: _____

Witnessed By:

Name: _____

Signature: _____

Date: _____ day of _____ 20__



**APPENDIX - C
KEY PERSONNEL**

The Proponent submits the list of the following Key Personnel and the assignment of the same for the execution of the Scope of Work. The Proponent agrees that the Key Personnel assigned to the Contract will be subject to AUA’s approval and at no time will be removed and/or reassigned without the AUA’s prior approval and consent of assignment responsibility.

Key Personnel List

Name	Title/Position	Project Responsibility	Location	Contact Information

The Proponent shall submit for each key personnel up-to-date resumes (CVs).

Key Local Personnel

The Proponent submits the list of the following key local personnel needed for the execution of the Scope of Work. The local support will be provided by AUA’s Acopian Center for the Environment in accordance with the agreed list of necessary local personnel.

Title/Position	Project Responsibility	Required workload (days)	Notes



Date: _____ day of _____ 20__

Signature: _____

Name and Title: _____

Witnessed By:

Name: _____

Signature: _____

Date: _____ day of _____ 20__



**APPENDIX - D
PROJECT EXPERIENCE**

Submit a minimum of three (3) projects relevant to the Scope of Work and services outlined in this RFP, completed by the Proponent and its Key Personnel, within the past five (5) years. The projects should be submitted as Appendix D. Provide the following information for each Project Experience:

#1 Project Name	Notes
Project Location	
Year Completed	
Year Completed	
Description of Project Type, Biogas Production Quality and Quantity	
Description of Services provided by the Proponent	
Proponent Key Personnel on this project including roles and responsibilities	
Current Status of the Project	
Project References including Owner/Client Name, Contact information, email, and physical address.	
Other notes (optional)	

#3 Project Name	Notes
Project Location	
Year Completed	
Year Completed	
Description of Project Type, Biogas Production Quality and Quantity	
Description of Services provided by the Proponent	
Proponent Key Personnel on this project including roles and responsibilities	
Current Status of the Project	
Project References including Owner/Client Name, Contact	



information, email, and physical address.	
Other notes (optional)	

#3 Project Name	Notes
Project Location	
Year Completed	
Year Completed	
Description of Project Type, Biogas Production Quality and Quantity	
Description of Services provided by the Proponent	
Proponent Key Personnel on this project including roles and responsibilities	
Current Status of the Project	
Project References including Owner/Client Name, Contact information, email, and physical address.	
Other notes (optional)	

APPENDIX - E
TECHNICAL APPROACH

Section	Section Items	Description
6.2.5.a.	Technical Approach Description and Methodology (up to 1200 words)	
6.2.5.b.	Explanation of Technical Expertise (up to 1200 words)	
6.2.5.c.	List of Expected Local Support	
6.2.5.d.	Assumptions, Clarifications	