

मुख्य कार्यालय, विरार
विरार (पूर्व),
ता.वसई, जि.पालघर - ४०१ ३०५.



दूरध्वनी : ०२५० - २५२५१०१ / ०२/०३/०४/०५/०६

फॅक्स : ०२५० - २५२५१०७

ई-मेल : vasavirarcorporation@yahoo.com

जावक क्र: व.वि.श.म./आरोग्य/९३०/२०२३.
दिनांक : ०१/०२/२०२३.

Vasai Virar City Municipal Corporation

VVCMC Head Office,
Manvelpada Road, Opp. Virar Police Station,
Virar East, Virar, Maharashtra - 401305

Quotations are invited for Design, Build, and Commission of 30 TPD Hotel Waste/Wet Waste to Biogas/CNG (Bio-methanation Plant) for Vasai-Virar City. All interested firms/agencies are requested to submit their quotations/ rates in a sealed envelope to the office of the undersigned or by email to aarogyaheadoffice@gmail.com within 7 days (i.e. 01/02/2023 to 07/02/2023; 04:00 pm) of this notice on website. Requirement shall be as per description of items/ specifications as mentioned below. Kindly mention the rates including all taxes.

Sd/-
Deputy Municipal Commissioner
Solid Waste Management Department
Vasai Virar City Municipal Corporation

You are therefore requested to submit the budgetary rates for below mentioned works.

A1. Scope of Work.

Capital Work Includes

- i. The Scope-of-Work will broadly include to setting up 30 TPD capacity Biomethanation with Compression, Cleaning and Storage Facilities Initially and provision for suitable expansion in future on Design, Built, Operate and Maintain for 15 years for Vasai Virar City Municipal Corporation at their own site or Gokhivare Landfill Site, in accordance with Solid Waste Management Rules 2016 (SWM Rules 2016) and other applicable rules & norms as amended from time to time.
- ii. VVCMC will provide @ 2 acres of land (at Old Vermicomposting Plant Location) for the proposed project on licence to use the land basis for 15 years. The operator shall initially Design, Develop, Build, Operate and Maintain the Facility for 30 TPD, however considering the future growth / expansion of the city area, provision for expansion of the plant, may also be considered.
- iii. The operator shall make their own water supply & electricity connection through the respective agencies at their own cost. However, VVCMC will help them to get these connections.
- iv. VVCMC will bear the CAPEX and will pay the Processing Fee on per ton basis. However, the operator shall have the right to sell the by-Products generated from the Plant (Such as CBG, CO₂, H₂S and Solid & Liquid Manure etc./on their own
- v. Inserts and rejects generated from the plant shall be handed over to MSW Processing facility available at Gokhivare Landfill Site for further processing. However, leachate generated from the plant needs to be traded by the operator within the plant premises only.
- vi. The operator should carry out necessary geotechnical surveys for considering the hydrological and flooding potential at sites, in order to mitigate any effect on the activities during concession period and in future.
- vii. The site shall be fenced or hedged and provided with proper gate to monitor incoming vehicles or other modes of transportation. The operator shall also provide CCTV surveillance covering the entire area of the plant. Adequate number of CCTV surveillance High Definition IP based cameras has to be installed at site. The operator should provide proper weighbridge of moderate capacity to measure the actual quantity of wastes received & processed at plant site.
- viii. The operator shall also provide necessary Industrial Safety & Fire Protection measures at plant site. They shall also provide utilities such as drinking water facilities and sanitary facilities (preferably washing/bathing facilities for workers) and lighting arrangements for easy operations during night hours shall be provided and safety provisions including health inspections of workers at site shall be carried out.
- ix. The operator shall take all the 'Statutory Clearances' required for the project at their own cost and expenses.
- x. The Detailed Engineering and Designs shall be vetted by institutes such as IIT / CSIR-NEERI/CSIR-IICT etc., which shall be appointed by VVCMC as Third-Party Vetting Agency at its own cost.

Basic Design Considerations

The basic design assumptions of the proposed organic waste treatment process involves critical examination of its ability to operate with an expected range of waste characteristics (quantity, composition), and an assessment of biogas potential and its utilization, wastewater discharge and outlet for digested residue (or any products there from). The basic technical assumption used in this case is summarized in Table given below:

Table 1 A Basic Assumption and Battery Limits

i.	A continuous operation is represented by 365 days in a year
ii.	The segregated organic mix wastes of minimum about 150 tones will have to be brought on project site by the operator.
iii.	Biogas generated, will be utilized for production of Bio-CNG.
iv.	Operator shall collect and transport the rejects generated at project site to the VVCMC's MSW Processing facility.
v.	Daily about 50 cum. of water is required for dilution of digested input per 50 TPD module. This aspect needs specific evaluation of project site.

Table 1 B - Design Considerations for Biogas Generation for each 50 TPD Module

Segregated Organic Waste	50 tons per day
Type of process	Mesophilic - Biomethanation through CSTR followed by Aerobic Treatment.
Biogas Generation	5,000 Cum./Day
GCV of Biogas	4,800 Kcal/Nm ³
Equivalent CBG Generation	As per the standards and Good Industry practise
Manure Generation	As per the standards and Good Industry practise

Major Process Components of Bio-Gas/Bio-CNG Plant

The proposed scheme includes the following sections:

- A. Water Storage Facility
- B. Organic Waste Bulk Hopper with conveying mechanism
- C. Automatic crushing plus segregator Unit with segregated (inert) waste removal mechanism, utilising the digested slurry or water, as required
- D. Equalization Tank with Dosing Tank / Feed Tank
- E. Anaerobic Reactors - CSTR
- F. Digested Solid - Liquid Separator and Manure Handling Section
- G. Biogas Collection & Storage
- H. Biogas Purification Section
- I. Bio-CNG Compression & Bottling Plant
- J. Gas to Electricity production unit (if required)
- K. Aerobic Treatment to the digested slurry and recirculation system
- L. Labour Rooms with WC facility.
- M. Weighing Control Room & Watchman Cabin
- N. Compound wall with Gate for the entire plant premises.
- O. SCADA & environmental monitoring control room
- P. State of Art Laboratory
- Q. Project office with Conference & meeting rooms

Sr. No.	Details
I.	Land Development
1	Land Gradation Cost

	2	Levelling
	3	Fencing & Gate
	4	Channel for Pipe Line
	5	Internal roads & storm drains within the battery limits of the land for plant allocated
II	Building & Other Civil Work	
	1	Feed Handling Area - PCC & Industrial Shed - 300 Sq. m.
	2	Steel Stack Structure with Chequered Plate
	3	Equalisation cum Dosing Tank - 50 Cum - RCC
	4	Anaerobic Digester - > 3600 Cum. - RCC
	5	Digested Slurry Tank - 2 Nos. - 50 Cum. each RCC
	6	Biogas Storage Room with Biogas Balloon - 500 Cum. Capacity
	7	CBG Bottling Plant with Storage Room
	8	Manure Storage Room with Platform
	9	Office Buildings/Lab/ Control Room/ Watchman Room
	10	Labour Room with WC - 4 Rooms
	11	Compound Wall & Gate
	13	Effluent Treatment Plant as per the requirement of MPCB meeting the discharge norms
	14	CBG Compression and Storage area with fencing as per PESO License norms

Sr. No.	Details	
III	Machinery & Equipment's	
	A	Feed Handling Unit
	1	Magnetic Separator - 6 TPH - 1 No.
	2	Submersible Agitator's - 17 KW x 4 No's
	3	Hopper for Unsegregated Wastes with waste conveying mechanism
	4	Food Waste De-Packer Machine with automatic segregation of inerts 7-8 TPH
	5	Separated Inert Material Storage Bins
	6	Screw feeder with screw/hose pump for feeding organic into digester
	7	Screw Pumps - 20 Cum./hr. - 3 Nos.
	8	Auxiliary Tanks(s) for Nitrogen Fixing
	B	Biogas Plant
	1	Double Membrane Bio Dome
	2	De-Moisturizer - 100 Cum./hr. - 1 No.
	3	Solid Liquid Separator - 10 Cum./hr. - 1 No.
	4	Digester Agitators - 3 Nos. - 7 HP
	5	Air Blowers - 50 Cum./hr. - 1 Nos.
	6	Instrumentation - 1 Set.
	7	Necessary Piping & Valve Fittings
	8	Heat Exchanger - Digester Heating System
	C	Biogas Storage Unit

	1	Biogas Balloon Room - Industrial Shed - 400 Sqmtr.
	2	Biogas Balloons - 100 Cum. Each - 2 Nos.
	3	Gas Blowers - 50 Cum./hr. - 1 Nos.
	4	Necessary Piping & Valve Fittings
D	Biogas Purification System - 250 Cum./hr.	
	1	H ₂ S & CO ₂ Scrubbers
	2	Necessary Piping & Valve Fittings
	3	Biogas Pressuring Tank
	4	Vacuum Pump / Blower
	5	Flow meters - 2 Nos.
E	Manure Handling Unit	
	1	Manure Handling & Preparation shed - 200 Sq. m
	2	Digested slurry manure separator (drum sieve/Decanter/Screw Press) x 2 No's
	3	Pumps and Air blowers with diffusers as per the ETP requirements
	4	Manure Storage Platform
	5	Manure Packaging Unit
F	Automation & SCADA System	
	1	Electrical Panel Board
	2	Control System - CPU - Power Stack
	3	Software and Revisions
	4	Sensors for Level, Temperature, Pressure

No.	Details	
III	F	Automation & SCADA System
	1	Visualization and Remote Maintenance (modem)
	2	Low Voltage Main Distribution System
	3	Installation Material (connecting pumps and sensors)
	4	Isolating panels with Relay's for agitator temperature and leakage sensing
	5	Profibus design PLC system with IP 65 Panels for outdoor installations
	6	Power and Data Cabling work with cable trays
	G	Bio-CNG Bottling Plant (200 Cum./hr.)
	1	Bio-Gas Enrichment conforming to BIS 16873:2013- Plant Capacity -300 Sm ³ /Hour.
	2	Booster High Pressure Bio-CNG Compressor - 170 Nm ³ /hr. @ 250 Bar
	3	Online Biogas Flow meters with volume correctors x 2 No's
	4	Online Gas Analyser x 2 No's (Raw & Clean Gas)
	5	Online Dew Point Meter x 2 No's (Raw & Clean Gas)
	6	Buffer Tank (Optional) Capacity: 40 Cum.
	7	Bio-CNG Filing Header with hoses, QRC's, Vent tubes, Coreolis type Mass Flow Meter for billing point
	8	40 Cylinder Cascades x 1 Day storage worth of Bio-CNG
	9	Installation & Commissioning
	10	Fire fighting DCP & CO ₂ type safety cylinders as per PESO norms
	11	Cascade handling equipment like hoist/goliath crane
	H	Commissioning Charges
	1	Start-up Culture Feeding
	2	Labour
3	Supervision Charges	
IV	Misc. Fixed Assets	
	1	Firefighting Equipment's (Fire Hydrant/Fire Cylinders)
	2	Chemical Lab Equipment and others
	4	Store
	5	Spare & Misc. Tools & Tackles
	6	Sign boards, safety signs and other items

Table 1: Desired Output Parameters

Sr.no	Parameters	Unit	Requirement
1	Methane percentage (CH ₄), minimum	%	90%
2	Maximum Carbon Dioxide (CO ₂)	%	4%

3	Carbon Dioxide (CO ₂)+ Nitrogen (N ₂)+ Oxygen (O ₂) percentage maximum	%	10%
4	Oxygen (O ₂) percentage maximum	%	0.5%
5	Total sulphur (including H ₂ S) mg/m ³ , maximum	mg/m ³	30.3
6	Moisture mg/m ³ , maximum	mg/m ³	16

1. Also as per the IS 16087:2016 specifications, the following shall also be met-
 - a. CNG shall be free from liquids over the entire range of temperature and pressure encountered in storage and dispensing system
 - b. The CNG shall be free from particulate matter such as dirt, dust, etc.
 - c. CNG delivered shall be odorized similar to a level found in local distribution (ref.IS 15319)
 - d. Electricity for auxiliary consumption and for sale

Permissions Required

The Contractor has to obtain all required permissions/NOCs (if required) from various authorities like:

- State/Central Level Environment Impact Assessment Authority (SEIAA), if required.
- Maharashtra Pollution Control Board (MPCB) – CTE & CTO.
- Revenue Department of Maharashtra for Royalty
- Petroleum and Explosives Safety Organization (PESO)

Summary sheet for the Cost.

Sr. No.	Particulars	Budgetary Cost (In INR)
A	for Design, Build, Commission of 30 TPD Hotel Waste/Wet Waste to Biogas/CNG (Bio-methanation Plant)with Compression, Cleaning and Storage Facilities (Provision of expansions as required in future with all component mentioned above) including site improvement, office space, pumps etc. complete	Total Capital Cost for Setting up of plant
B	Carrying out of O&M of the plant for 15 years (Give Annual cost for the 1st Year on Tipping fees per ton of collected waste at site	Tipping fees Rs. ___ Per Ton or waste collected at site for First Year of Operation.

For
Vasai Virar City Municipal Corporation