

**Proposal for Supply, Installation And O&M (5 Years) For Ms. SUDA TPD Bio-Methanation Plant (5 No.) For Organic Market Waste Locations Under Bidhannagar Municipal Corporation (4 Nos.) And New Town Kolkata Development Authority (1 No.) Areas Through E-Tender**

This is the proposal for installation of decentralized Biomethanation units in areas under Bidhannagar Municipal Corporation (4 Nos) And New Town Kolkata Development Authority (1 No.). The nature of areas such as markets have been identified across the abovementioned ULBs, and depending on availability of space near the markets, locations have been ascertained where Biomethanation units may be installed to treat the incoming market waste within the ULB in a decentralized manner. PricewaterhouseCoopers Private Limited, the transaction advisor, duly engaged by SUDA for assisting State Government for scientific planning of solid waste management with cluster approach and bid process management, has designed the scheme of decentralized waste management which is duly incorporated in the technical feasibility report submitted by them for the SWM Cluster II project, duly approved by Technical Committee(SWM Task Force) on 21.11.2019.(TFR enclosed)

***Process in brief***

This is the anaerobic (in the absence of free oxygen) fermentation of biodegradable matter in an enclosed space under controlled conditions of temperature, moisture, pH, etc. The waste mass undergoes decomposition due to microbial activity, thereby generating biogas comprising mainly of methane and also digested sludge, which is stabilized. Like composting, bio-methanation is one of the most technically viable options for Indian municipal solid waste (MSW) due to the presence of high organic and moisture content. This process produces gas on daily basis, which could be converted into electricity for captive or any other purpose. This is applicable for the bulk generators, such as – vegetable and fruit markets, sabzi mandis etc. The process produces Methane gas, which can be utilized for cooking purposes. Furthermore, if this Methane gas is made to pass through generation chamber, electricity is produced. This electricity can be utilized for various lighting purposes. Another by-product is Compost, that is utilized for landscaping purposes.

*The approach of using decentralized systems such as biomethanation for bulk generators is recommended in MSW rules 2016 by MoEF&CC (Clause 15.v (a); 15 (t) - page 9)*

***Features***

It is recommended in the TFR developed by PwC-TA to install 5 TPD Biomethanation Units at 5 different locations (mainly to cater to wet waste generated from large markets) in Bidhannagar and New Town Kolkata Development Authority. The technical specifications of the units have been approved by the Technical Committee (SWM Task Force) in its meeting on 21.11.2019.(Minutes enclosed).

The total waste that will be catered to will be as follows:

1. BMC – 5 TPD x 4 = 20 TPD (approx. 2% of the total waste generated, and 8% of total wet waste generated in BMC)
2. NKDA – 5 TPD x 1 = 5 TPD (approx. 10% of the total waste generated, or 18% of total wet waste generated in NKDA)

***Proposed sites with area requirements***

The land parcels required for the decentralized facilities are available and are under the possession of the ULB. The details of the proposed land parcels are placed in the TFR submitted by PwC-TA to the SWM Task Force on 21.11.2019. The per unit requirement is not more than 500 sq. m. BMC and NKDA need to ensure space and basic utility provision at each site.

***Scope of work***

Considering the benefits of biomethanation system to treat market waste at source, and given the availability of biomethanation units with specifications as suggested in market, it is proposed to float an e-tender for supply and installation of 5 tpd biomethanation units along with operation and maintenance initially for a period 5 years, keeping the scope of work as envisaged in the RfP as described in the RfP document duly drafted by PwC and approved by the Technical Committee. As indicated in the RfP the scope of the bidders include supply, installation, commissioning and complying relevant clauses of SWM rule 2016 as well as operations, maintenance and repairs through O&M services under contract (5 years renewable). Salient features of their scope is mentioned below:

**Scope of work involved (Includes Construction, Warranty and O&M of facility):**

The Bidder will Design, Build, Operate and Maintain the plants for a period of 5 years.

- The Bidder will provide 5 TPD Bio-Methanation Plant producing Energy and Compost adhering to prescribed standards. The remnant (if any) shall meet disposal standards suggested by CPCB, SPCB and draft MSW Rules 2016.



- The Technology suggested/offered shall follow all applicable standard regulations of CPCB, SPCB and draft MSW Rules 2016.
- The Bidder should set up necessary infrastructures including plant, building, machinery and other necessary utilities as required. There should be a weighing machine consisting of a container for collection and weighing the waste.
- The facility shall be set up at the land free from encumbrances provided by the ULB.
- The Bidder should obtain necessary statutory clearances/permissions.
- The bidder will raise invoice to SUDA for the Installation and O&M of the plant as per Schedule of Payment.
- The work shall have to be executed in accordance with the drawings (prepared by Bidder) and approved by the competent authority and shall have to meet high standards of workmanship, safety and security.
- The bidder will have to test the compost as byproduct generated through NABL accredited labs and submit the test certificates. The compost produced should be certified as per Fertiliser Control Order (FCO) standard.
- The bidder would be responsible for processing of waste from the following markets (mentioned in the table below) and as mentioned below:
  - Salt Lake - Duttabad (Sector I) (BMC)
  - Salt Lake - IB (sector III) (BMC)
  - Salt Lake - AK block (left to Kathgola Island), Sector II (BMC)
  - Rajarhat - Harichand Polly (BMC)
  - CG Market – New town Kolkata (NKDA)
- The Bidder shall be responsible for Water and Electricity required to be consumed during the period of Construction and O&M of the plant.
- The Bidder shall minimize odour generation, prevent off-site migration of gaseous emissions. Ambient air quality at the site and in the vicinity shall be monitored to meet the specified standards as per CPCB and SPCB rules and regulations, MSW rules 2016 and other applicable laws/rules.
- The Installations shall be manned, and the Bidder should ensure a complete and continuous O&M of the plant for 24 hours, 365 days a year and for the entire contract duration of 5 years irrespective of Holidays and Sundays.
- The bidder shall be responsible for keeping security guard 24 hours, 365 days a year and for the entire contract duration of 5 years irrespective of Holidays and Sundays.
- The Bidder should endeavor & ensure running of the system for 365 days during which the segregation of Municipal Solid Waste (MSW) shall not be stopped for the reasons other than mentioned below: -
  - Any Power shutdown.
  - Any Electrical breakdown.
  - Due to any other reasons specified by the ULB
- Even in the cases mentioned above, the restoration of the system should be done with least interruption.
- The Construction and manufacturing defects during the contract period shall be attended by the bidder at his own cost.
- Tools and tackles required for operation and maintenance should be provided by the bidder.
- Tightening of foundation bolts, checking of oil, lubricating, greasing, preventing leakage, cleaning the equipment every day whenever required
- All stoppages shall be repaired expeditiously.
- The bidders are expected to employ reserve operators in performance of contract consequent to labour regulations/statute on working of personnel on National Holidays etc., and on any day when operator(s) is/are absent from duty.
- The operating personnel shall have thorough knowledge of safety precautions during emergency cases and be conversant with the rules/regulations, IE Act/ Rules and Indian

Factory Act/Rules. It will be ultimate responsibility of the bidder to maintain the requisite safety standards as per the MSW Management Rules 2016 and applicable guidelines.

- The Bidder shall provide a Notice Board on which the precautions have to be taken by operation and maintenance staff have to be exhibited.
- A daily record should be maintained for any further inspection. The daily charts must also include use of Personal Protective Equipment/ gears used by the bidder's personnel.
- Daily charts of the personnel are to be displayed in the premises. The engineer in charge can inspect the attendance on the basis daily charts.
- The Operation and maintenance contract covered by this agreement shall be for 60 months.
- The Operation and Maintenance contract is extendable for further period as per site requirement with mutual consent of both parties.
- The Bidder will conduct capacity building workshop(s) for the SUDA staff or SUDA nominated personnel for the Operation and Maintenance of the plant.

**Product Specification:**

There should be a segregation unit in the area allocated for segregation and the Bidder will be responsible for segregating the waste as per input quality. The detailed technical specification of the same is described below:

| SN | Parameters              | Minimum Requirements                                  |
|----|-------------------------|---|
| 1  | Plant Feed              | Organic market waste, food waste, vegetable waste etc |
| 2  | Plant capacity          | 5MT/per day   |
| 3  | Gas production capacity | at-least 300 cu. Mt/ day                              |
| 4  | Power Generation        | at-least 300 – 350 units/day                          |
| 5  | Plant area              | 500 SQM   |
| 6  | Compost                 | 5- 7 MT/month per plant                               |

**Bidding Parameters**

The two-bid evaluation of the RfP where financial bids of only the bidders who are found technically qualified shall be opened and processed for evaluation. Financial bids shall be evaluated as per the methodology below:

| Description of item   | Qty.  | Quoted Rate including all taxes but excluding GST | GST for Supply and installation | O& M Cost for five Years including all taxes but excluding GST | GST for O&M for five years | Total       |
|---|-------|---|---------------------------------|--|----------------------------|-------------|
| A   | B     | C   | D                               | E  | F                          | G = C+D+E+F |
| Supply, Installation And O&M (5 Years) For MSW Based 5 TPD Bio-Methanation Plant (5 Nos) For Organic Market Waste Locations Under Bidhannagar Municipal Corporation (4 Nos) And New Town Kolkata Development Authority (1 Nos) Areas Through E-Tender | 5 Nos | Rate to be Quoted by Bidder                       | To be Quoted by Bidder          | Rate to be Quoted by Bidder                                    | To be Quoted by Bidder     | Calculated  |

**Role of ULB**

For effective functioning of the Biomethanation Units the ULBs have to ensure certain aspects as mentioned below:

- (i) ULB should ensure collection and transportation of segregated biodegradable waste to each of the individual sites with at least 5 TPD of wet waste.
- (ii) ULB should provide/ensure space of 500-sq. mt, in the indicated locations (as specified in the list) for installation of the machine(s).
- (iii) ULB should ensure all Electrical and Instrument/power cabling to bring power to the site from outside.
- (iv) ULB should ensure all access roads, boundary walls, drainage.
- (v) General security of the area to protect the equipment and the people.
- (vi) The operation and service contract of the Biomethanation plant will be given to the project operator.
- (vii) Additional services can be provided on a chargeable basis.

**Cost Assessment**

The indicative capital expenditure and operational cost as worked out by PwC-TA in the TFR and duly appraised by the Technical Committee (SWM Task Force) is as follows.

| Item                         | Rate in lakh/unit |
|------------------------------|-------------------|
| Capital Cost                 | 251.24            |
| O&M Cost per annum           | 20.10             |
| Total capital cost (5 units) | 1256.20           |
| Total O&M cost for 5 years   | 100.50            |