

Decentralized Solid Waste Management



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As per Solid Waste Management Rules, 2016

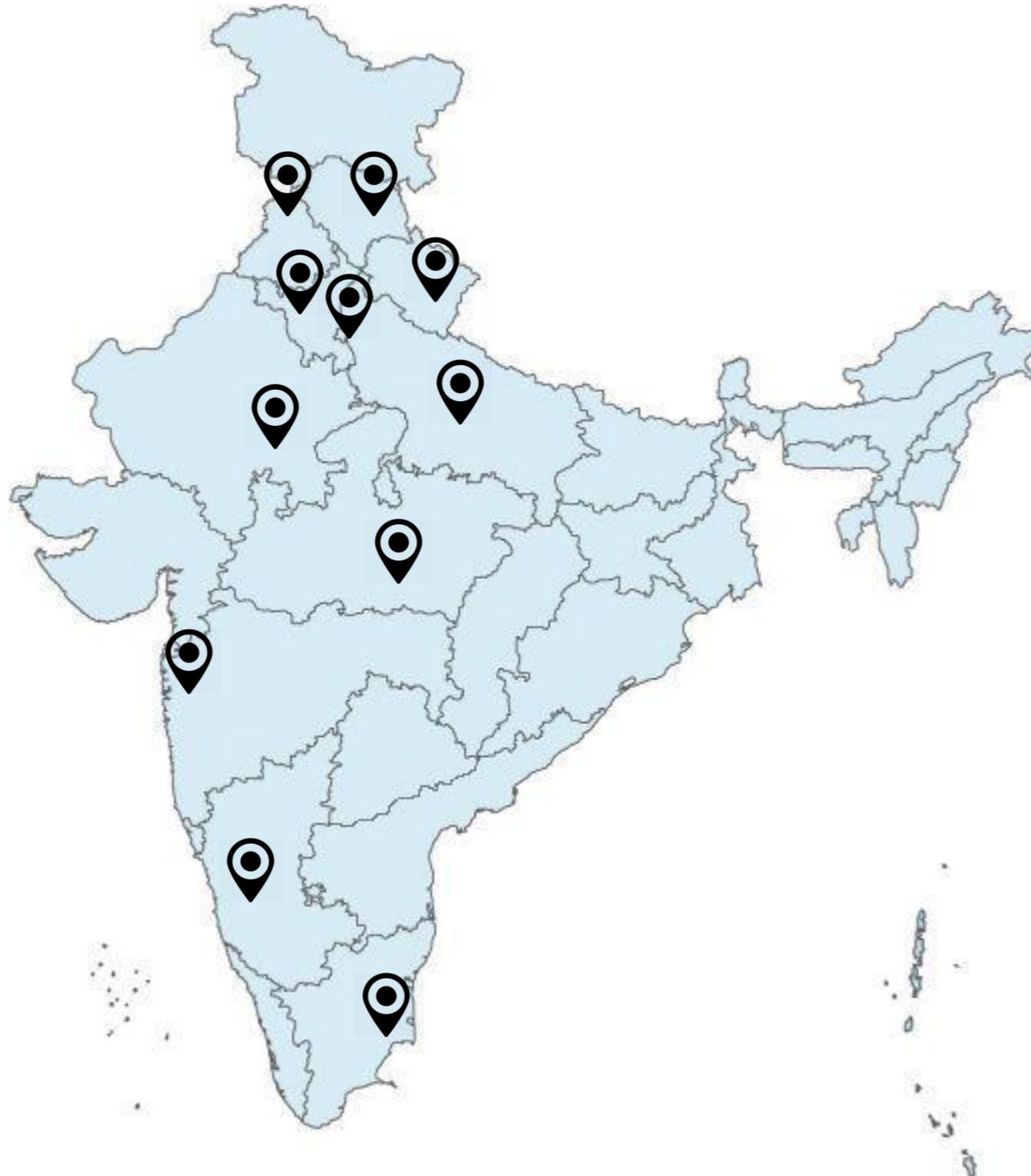
About us:



GBES is an IIT Delhi Start-up of 2013; in the field of biogas generation & purification.

- **Have IIT Delhi – “patented technology for biogas purification for BioCNG”**
- **Have technology tie up with BARC for biogas plants- “Nisargruna”**
- **Have developed and applied for patent for de-centralised waste processing plant- “ BioboxX”**
- **Offer Mechanized Organic Waste Composting: “Bio-Composters”**
- **Also providing solutions for inorganic waste- PET Bottle crushers & compactors.**

Presence In India



GBES – OFFERING

Providing comprehensive , Decentralized Solid Waste Management Solutions:

- * Organic fraction of the waste is treated into energy and liquid bio-manure or just compost
 - Bio-boxX
 - Nisargruna
 - Verticle FRP Based Biogas Plants
 - Bio-Composter
- } Bio-methanation
- * Recyclables: Consist of plastic, PET Bottles, metals glass, paper etc. These are segregated and compacted with a volume reduction of upto 90% and sold.
 - * Balance, which are generally inert of 5 to 10% , are sent to the landfill.

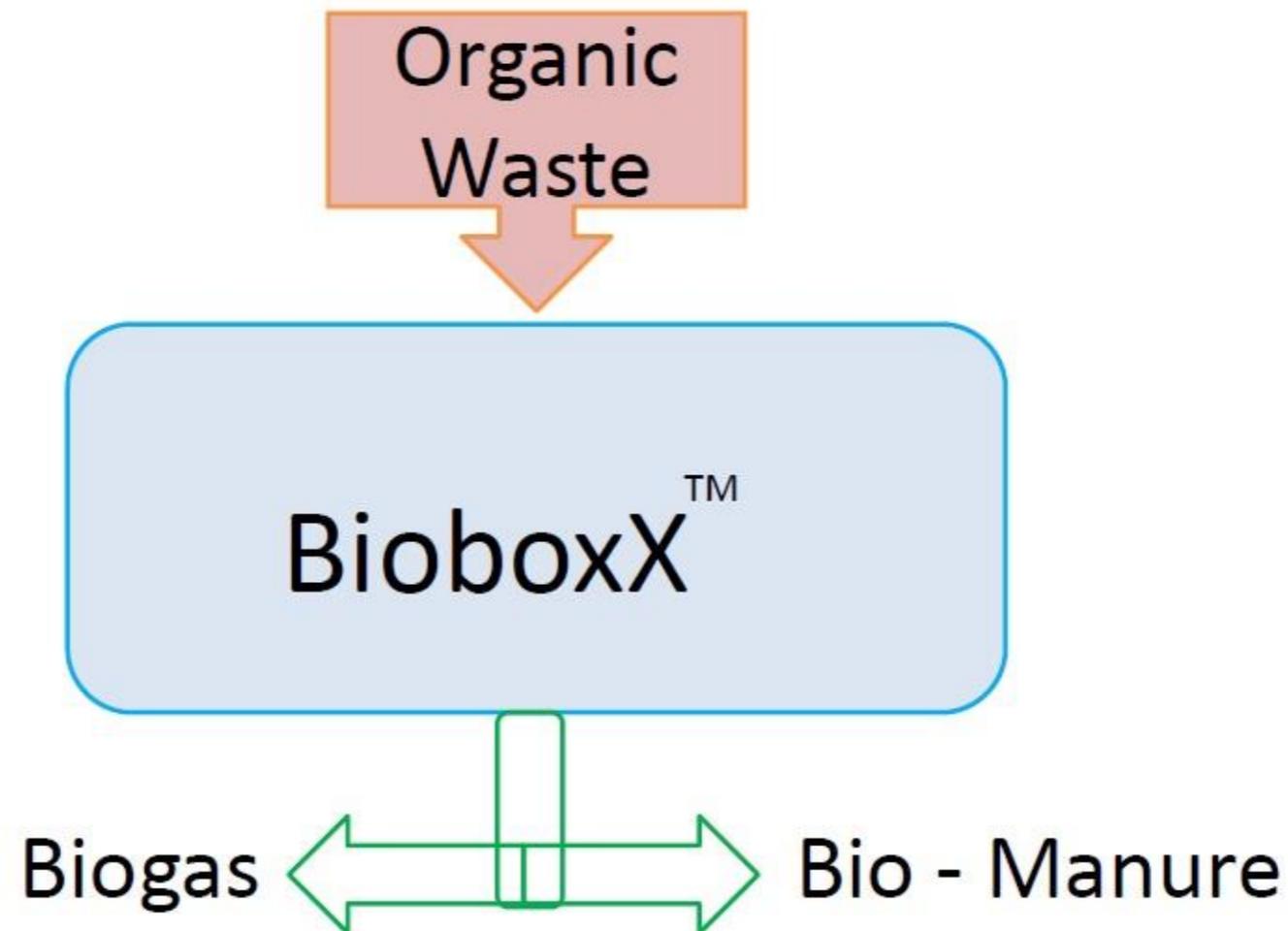
Bio-boxX

a self sustainable organic waste processing unit



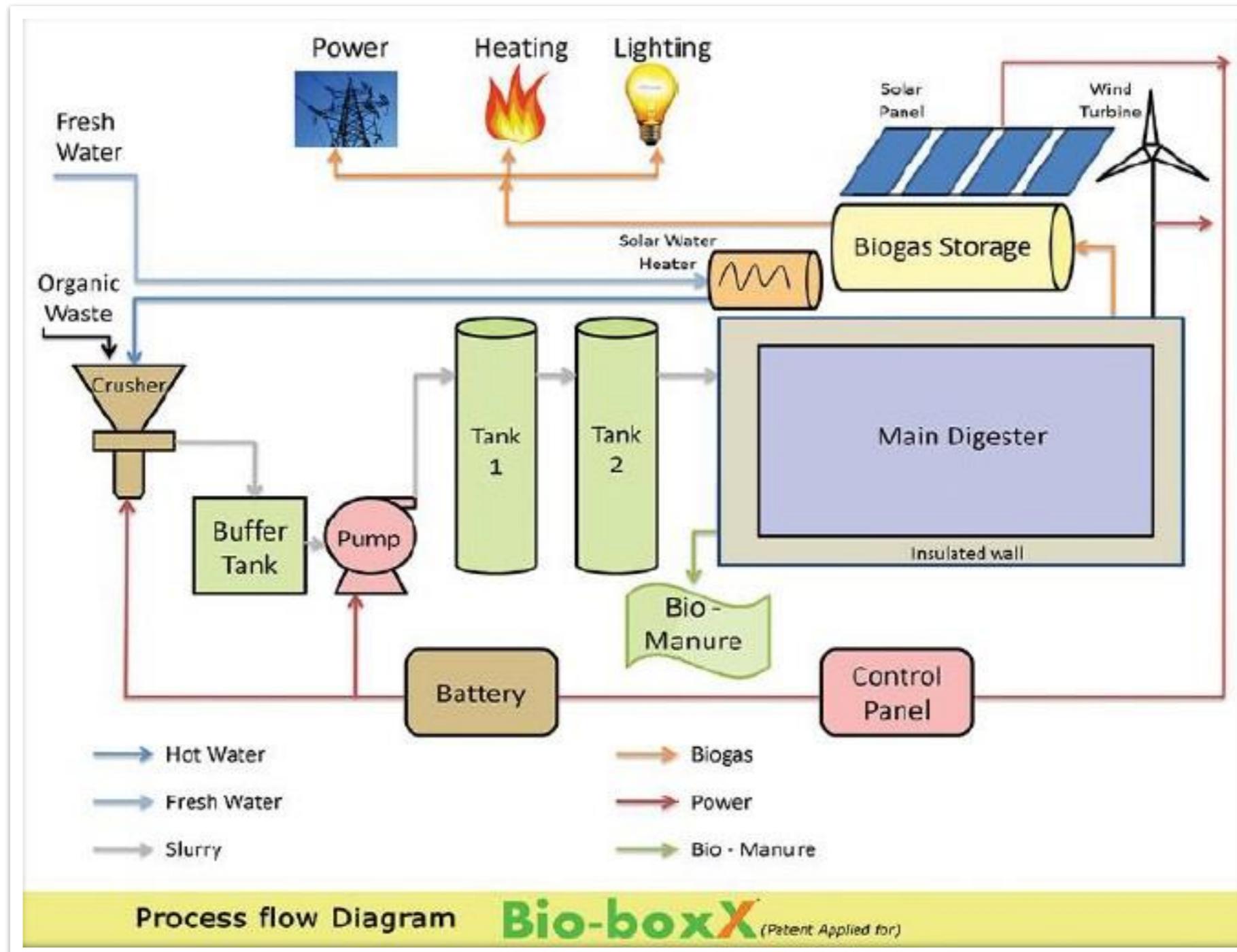
ONE who generates, be the ONE who treats!!!

What is Bio-boxX™?



Standard 20-40 feet Containerized Waste Processing, Plug & Play Type Modular Biogas Plant that can process all kinds of Organic/Biodegradable waste to generate **Biogas & Bio-Manure.**

Process Flow Diagram:



Bio-boxX™ : A Sustainable Solution



Bio-boxX™ : Facts

1 unit of 'Bio-boxX™-1000'

- * Can process organic waste from 2000-2500 households on daily basis.**
- * Is capable of saving 221 tons CO₂eq of GHG emissions per annum.**
- * Is capable of full-filling daily cooking requirement of 179 households.**
- * Is capable of lighting around 1000 households with 2 LED x 10W for 5 hours a day.**
- * Generates sufficient bio-manure for the yearly need of 1 acre farm / horticulture land in every 5 days.**

Bio-boxX™: Salient Features

- * Multi feed / Kitchen / Organic / Horticulture Waste etc.
- * Plug & play / Compact / Factory-fitted
- * Modular unit & can be expanded easily
- * Odour free operations
- * Renewable green energy
- * Long life –15 years –Corrosion resistant FRP material
- * Hybrid renewable energy system to harness wind and solar power.

Continued ...

- * Compact size makes it suitable for any location.**
- * The interior walls are insulated with 60mm PUF coating protecting against heat, leakage and corrosion.**
- * Suitable for all climatic conditions**
- * Warm water supplied makes the digestion process efficient and overcomes the bottlenecks of weather conditions**
- * No residual left after the processing**
- * Calorific Value is of Raw Bio Gas is 50% of LPG**

Technical Specifications:

Description	Model -1 BioboxX 0.5 TPD	Model -2 BioboxX 1 TPD
Processing Capacity	500 Kg/Day	1000 Kg/Day
Size (Space Required)	500 sq. ft	1000 sq. ft
Bio Gas Generation	35-40 n.cu.m/day	70-80 n.cu.m/day
LPG Equivalent	18-20 Kg/Day	36-40 Kg/Day
Power Equivalent of Bio gas	50-60 Units/day	100-120 units/day
Bio Manure production	800 Ltr/day	1600 Ltr/day
Daily Electrical Consumption	12 Units per day	18 Units per day

Bio-boxX™ : Ideal for

- Large Kitchens / Canteens
- ULB's having low waste potential
- Institutions / Factories / Organizations
- CSR Activity
- Hotels & Resorts
- R&D for Educational Institutions
- Industries aiming for Zero Waste Discharge
- Housing colonies –RWAs
- Exhibition Grounds
- Mobile Defense Units

Our Valuable Clients of Bio-boxX™:-

- **Indian Railways:**
 - NWR- Jaipur station
 - Sarai-Rohilla- New Delhi-IROAF
 - ICF- Chennai
 - DMRC- Shastri Park – New Delhi
 - BCT- Mumbai
 - ECoR, Khurda Rd.- Cuttack
(under installation)
- **Municipal Corp:**
 - Tumkuru Corporation City
 - NDMC- Sarojini Nagar
 - Shimla Municipal Corporation
(under works)
- **Apartments/Residential Societies:**
 - DRA-NBCC, East Kidwai Nagar-
New Delhi- **(4 + 2 TPD)**
(under works)
- **Educational Instt- Campus**
 - BITS- Pilani
- **Mini Dairy Plants:**
 - Sushma Sehgal- Lucknow
 - Saurav Yadav- Barabanki- UP
- **Hotels:**
 - Eros – Intercontinental, New
Delhi
- **Factories:**
 - CFCL- Kota
 - Cecon Pollutech- Lucknow

Jaipur Railway Station, Jaipur - 0.5 TPD



Kishanganj Railways Station (IROAF), New Delhi -1 TPD



Tumkur Municipal Corporation, Tumkuru (Karnataka) -3 TPD



Delhi Metro Rail Corporation, Shastri Park, New Delhi - 1 TPD



Bombay Central Terminal (BCT), Mumbai, 0.5 TPD.



BITS, Pilani - 2 TPD



Eros International Hotel, New Delhi - 1 TPD.



Chambal Fertilizers & Chemicals Ltd, Kota - 0.5 TPD



DRA-NBCC, East Kidwai Nagar, New Delhi - 1 TPD



Integral Coach Factory, Chennai - 0.5 TPD.



New Delhi Municipal Council, Sarojini Nagar - 0.5 TPD.



Nisargruna Biogas Plants (BARC Technology)

- NISARGRUNA, a biogas plant, based on biodegradable waste, has been developed by the NA&BTD (Nuclear Agriculture & Biotechnology Division), BARC.
- NISARGRUNA plants are designed for handling and processing the biodegradable waste materials generated in kitchens, vegetable markets, slaughter houses, food and fruit processing industries, agro-waste and biomass in a decentralized manner.

Nisargruna Biogas Plants (BARC Technology)

Our Projects:

- 1) Tihar Jail, Delhi: 0.7 TPD
- 2) BHU, Varanasi: 5 TPD
- 3) UPRNNL, Lucknow: 4 TPD
- 4) DAMB, Delhi: 15 TPD (Under works)

Tihar Jail 0.7 TPD

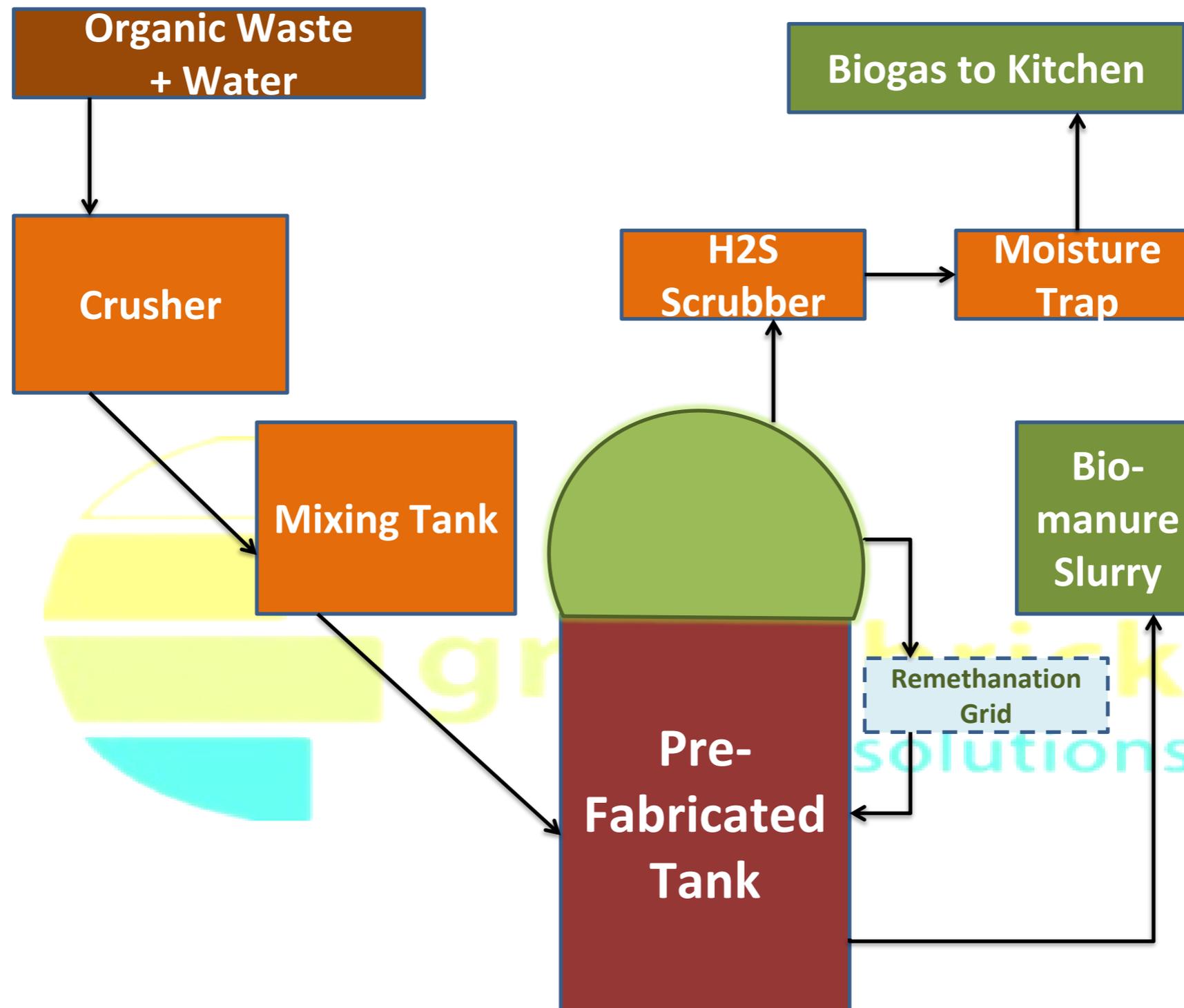


BHU 5 TPD



Pre-fabricated Vertical Biogas Plant

- Alternate Bio-methanation solution



About Bio-Capsule

- Bio-Capsule is a modular Vertical Biogas Plant which is designed to minimize the land requirement in installation of Biogas plant without compromising processing capacity.
- Bio-capsule is also suitable for processing different type of organic waste such as kitchen leftover, green grass, leaf litter, animal remains in abattoirs, green plant waste, cow dung, etc..
- Made from corrosion resistant material to have a long life and this capsule is suited for all climatic condition and it comes from 1 TPD to as per requirement.

5 TPD Bio-Capsule Biogas Plant



Bio-Capsule Full View



Bio-Capsule at NBCC, East Kidwai Nagar New Delhi

Mini Biogas Plants

- Mini Biogas Plants are small capacity Pre-Fabricated Floating Dome type Anaerobic Digesters.
- Made from corrosion resistant Fibre-Reinforced Plastics (FRP) which makes its life longer.
- This Mini Biogas Plant can process any type of organic waste including kitchen waste, cattle dung, horticulture waste and so on in an eco-friendly manner and helping to manage carbon footprint by producing biogas & Organic manure.

Mini Biogas Plant



Mini Biogas Plant at Brake Parts Sonipat, Haryana



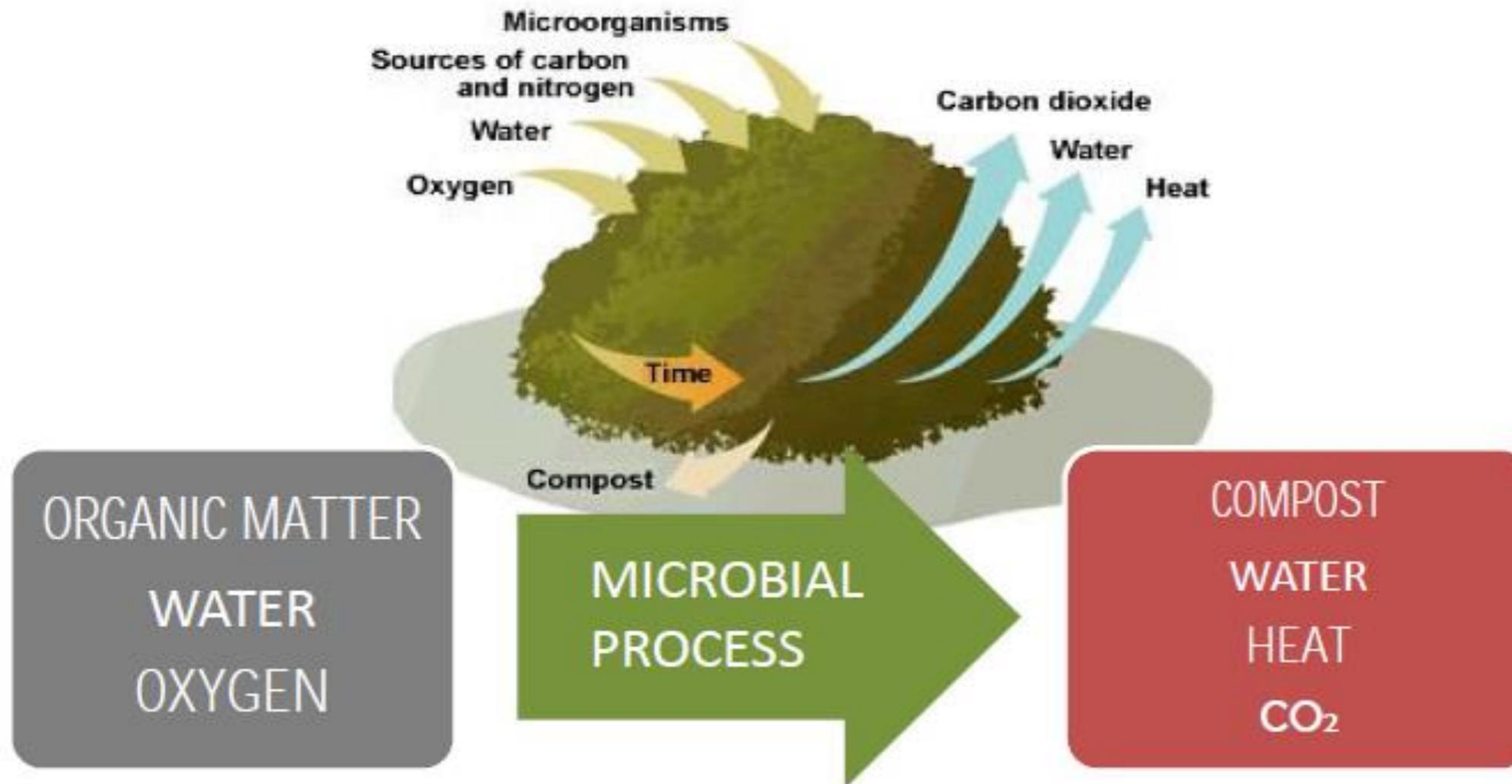
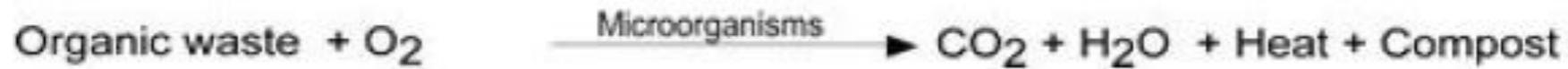
Mini Biogas Plant at Army Public School New Delhi

Bio-Composter



Fully Automatic In-Organic Waste Composters that convert all kinds of organic waste into manure in a controlled and enclosed system, without the use of any external heating.

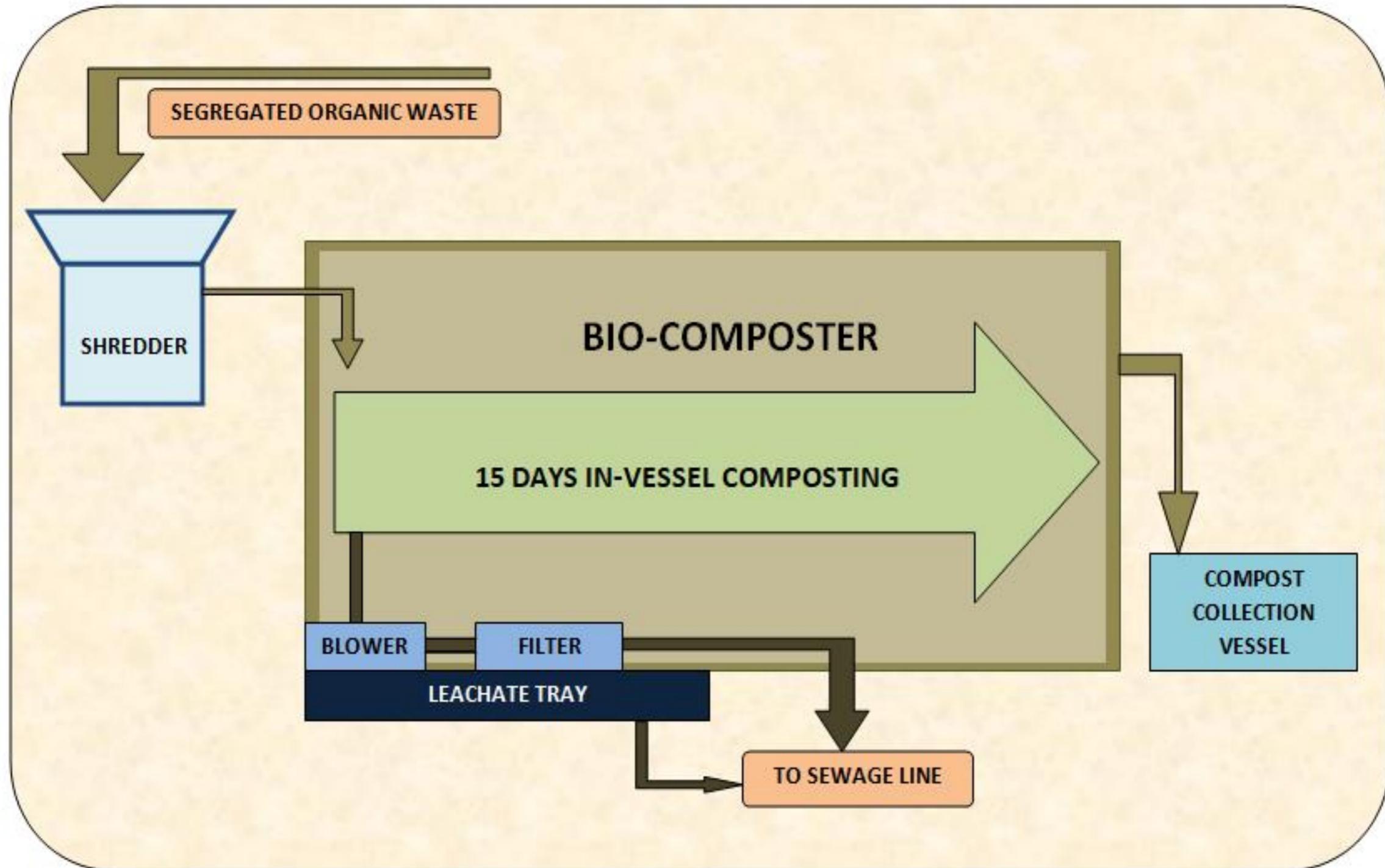
COMPOSTING PROCESS



This process, which traditionally takes about 45-60 days for the compost to be ready, is carried out within 15 days time by the Bio-Composter.

Bio-Composter

- Process flow diagram



Key features of Bio-Composter:

- **True Composting:** 15 Days Retention capacity given for producing natural and quality compost, and not BURNT CARBON.
- **Aerobic Process:** Continuous supply of oxygen maintained with the help of the blower.
- **Accelerated and Controlled:** In-vessel mixing, churning and curing of waste
- **No Artificial heating:** The natural exothermic reactions produce just the right amount of heat required for efficient composting of the organic matter. This also means that the system consumes very low amount of electricity.
- **PLC Controlled Operations-** Automatic running of Drum Motor and Blower, meaning no human intervention required other than the daily feeding of waste.

Continued..

- **No Foul Odour:** Enclosed system, provided with Activated Carbon based filter, ensuring that there is no obnoxious odour around the facility.
- **Less Space required:** Since the cycle takes only 15-days, the system takes up much smaller space as compared to a manual composting setup.
- **Modular system:** Additional units can be installed for increasing processing capacity of organic waste.
- **Long life:** All internal contact parts made of anti-corrosive FRP material.
- **Daily production of Organic Compost (20-35 % of input material),** post commissioning, as per quantity of daily waste feed.

Bio-Composter

Technical Specifications

Model No	GBES 25	GBES 50	GBES 100	GBES 250	GBES 500	GBES 1000
Capacity (kg/day)	25	50	100	250	500	1000
Connected Load* (HP)	1	2	2.5	4	7.5	10
Consumption*(Units/day)	1-2	1-2	2-3	4-5	7-9	12-14
Dimensions WxHxL (m)	1.2x1.3x2.5	1.2x1.3x3.2	1.4x1.5x3.3	1.5x1.6x4.3	2.2x2.2x4.2	2.5x2.5x6.3
Space Required (m ²)	8	9	10	13	17	26
Monthly Operating Cost* (Rs.)	600	1,200	2,200	5,000	9,500	18,000

Our Valuable Clients of GBES Bio-Composter:-

- * **Hotels, Restaurants, Marriage Gardens:- Airport Residency (Delhi) , Mitali Garden**
- * **Offices / Residential Complexes:- DLF in various buildings, Gurgaon One (Gurgaon) , NHPC-Mandi , NHPC-Kullu, GPRA Complex (EKN, Delhi)**
- * **Schools/Hospitals:- Choithram (Indore)**
- * **Temples:- Hanuman Temple, Banke Bihari-Punjabi Bagh (Delhi), Iskon Temple (Delhi), Jhandewala Mandir (Delhi), Birla Mandir (Delhi, Jagannath Mandir (Delhi)**
- * **NGO's:- Sledgehammer Foundation (Faridabad)**
- * **Club:- The Country Club (Delhi)**
- * **Factory:- IPCA, Indore**

The Country Club, Delhi



Choithram School, Indore



Mitali Garden, Indore



Madhu Jas, Indore



NHPC- Kullu



NHPC-Mandi



Gurgaon One, Gurgaon



Banke Bihari Mandir, Punjabi Bagh, Delhi



DRA-NBCC, GPRA Complex, East Kidwai Nagar, Delhi



NBCC

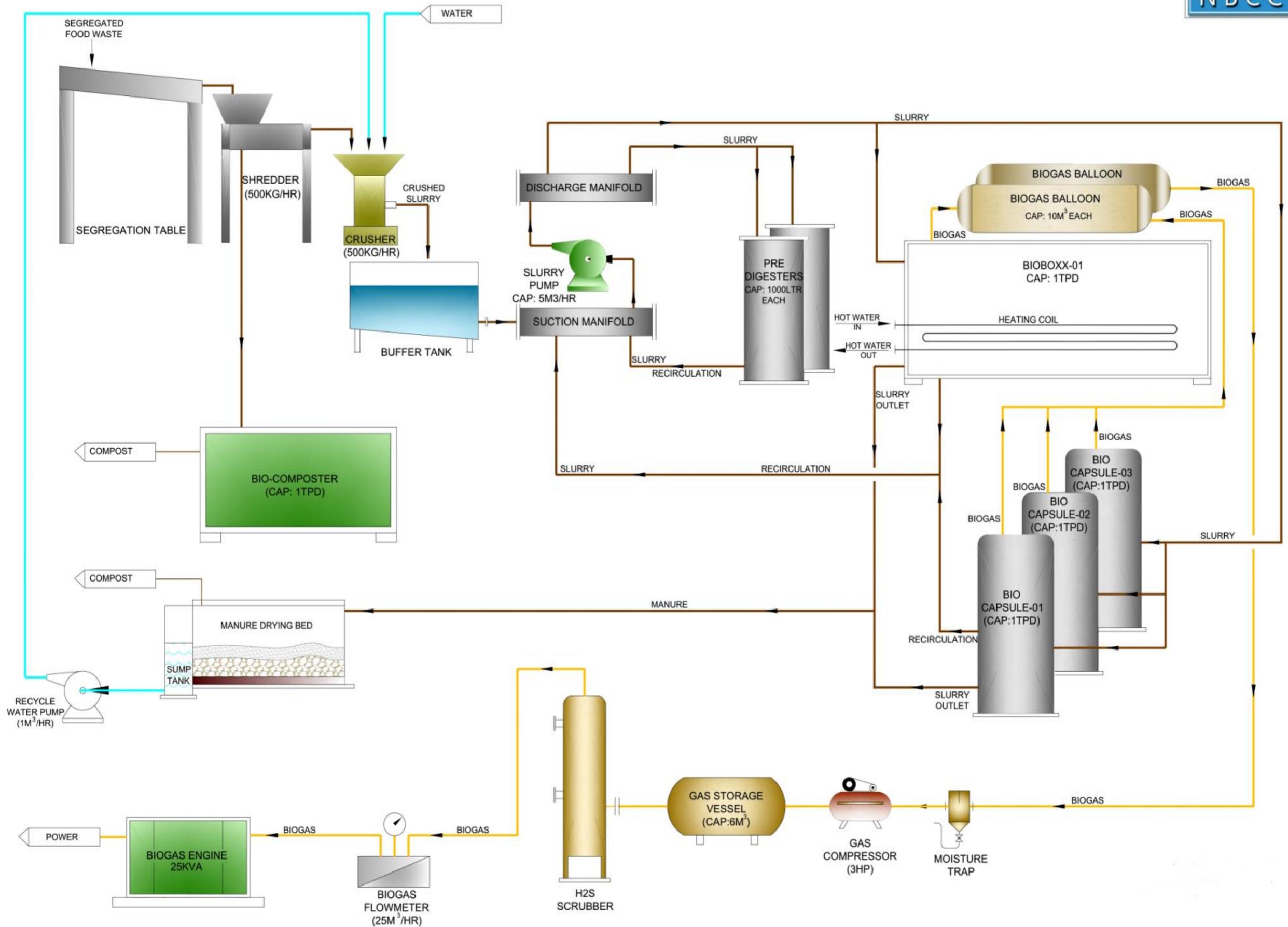
East Kidwai Nagar Apartments

**Comprehensive
Solid Waste Management Project**

6 TPD Bio-methanation

1 TPD Composting

PROCESS FLOW DIAGRAM FOR 4TPD SOLID WASTE MANAGEMENT & POWER GENERATION SYSTEM



OUTPUTS

BIOGAS

*Power
Generation*



Car Park lighting

COMPOST

*Bought
back by
NBCC*



Horticulture



1 TPD
Bio-boxX
(Horizontal)

5 TPD
Bio-Capsule
(Vertical)



1 TPD Bio-
Composter

GBES Biogas Purification

A few of our

Purification Projects

Gail India Ltd, New Delhi.



Plant details:

Capacity: 50 N.Cu.m/hr

Substrate : Landfill Gas

Application: Electricity Generation

Stage: Installed, Commissioned &
Running.

IOT Mabagas



Biogas cleaning system at IOT Mabagas
(Biogas: 1250m³/hr, 1.2 MW)
Substrate: **Poultry waste & Press mud.**

NSL Sugars, Koppa



NSL Sugars, Koppa
(Biogas : 650m³/hr , 1.4 MW)
Substrate: Mollases based spent
wash

KITL, Punjab



Biogas cleaning system at KITL
Biogas: 500m³/hr, 1.2 MW
Substrate: Punjab Agro waste

Metro Water, Perungudi



Biogas Cleaning system at
Chennai Metro Water, Perungudi
Biogas: 350m³/hr, 1 MW
Substrate: STP

Mahindra & Mahindra, Chennai



Plant details:

Capacity: 100 N.Cu.m/hr

Substrate : Kitchen Waste

Application: Bio-CNG

Stage: Installed, Commissioned & Running.



Recently Inaugurated By Hon'ble Ministry Of
Power Piyush Goyal

Century Pulp & Papers, Lalkuan



Plant details:

Capacity: 500 N.Cu.m/hr
Substrate : Paper Processing Waste
Application: Bio-CNG
Stage: Installed, Commissioned & Running.

Green Note



221 tons of CO₂ equivalent per year could be saved by processing 1000 kg organic waste per day. Proper processing can convert waste into a Raw Material !!

Thanks..