

“Generation of Energy through decentralized Waste treatment”

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Introduction

In accordance with the fast growing population, the demand for energy and the discharge of waste are increasing day by day. To overcome the energy crisis, alternative energy sources are the only remedy. Generation of energy from waste is beneficial in many ways. It is most suitable for eco-friendly waste disposal and also for energy generation.

There are two waste treatment systems. One is centralized and the other is decentralized. In decentralized waste treatment system, anaerobic biomethanation / bio gas technology is commonly acceptable. This technology helps to treat the organic waste hygienically and valuable renewable energy and organic fertilizer can be produced.

The biogas technology enables one to produce bio energy in the households by treating the wastes generated in the houses. This technology is also made applicable for treating the wastes produced from public places like markets, slaughter houses, hotels, convents etc and for generating electricity without causing any pollution to the atmosphere.

Biomethanisation Technology

Biomethanisation is a universally accepted and proven technology for Bio energy generation from bio wastes. It is very simple and user friendly. Through the adoption of biomethanisation technology all degradable wastes can be treated with the help of different types of anaerobic bacteria / microbes in a concealed chamber / digester. Treated biomaterials, coming out from the digester in the form of liquid or solid can be used as a very good organic fertilizer.

Types of wastes that can be treated under Biomethanisation Technology

All easily degradable materials including cooked and raw food wastes, fruits and vegetable wastes, fish and meat wastes, excreta of all domestic and wild animals and birds and waste water containing bio waste materials can be treated with this technology. Slow degradable materials like vegetables, green or wet plant parts can also be treated with this technology, using specially designed anaerobic pre-digesters

SOCIO-ECONOMIC BENEFITS

- ❖ Generation of Energy in the form of Bio Gas
- ❖ Generation of organic fertilizer.
- ❖ Saving of Garbage dumping land.
- ❖ Minimum waste collection expenses.
- ❖ Better utilization of wastes.
- ❖ Employment Opportunities

Domestic waste treatment through biogas technology

Domestic Bio waste treatment Biogas Plants: -

These plants are suitable for the treatment of all bio degradable wastes and organic waste water generated in the houses. The biogas generated from this plant can be utilized for cooking. It is sufficient to meet more than 50% of the energy required for cooking everyday.



TECHNICAL DETAILS OF 1 CUM FAMILY SIZE BIO WASTE TREATMENT PLANT

Waste Treatment Capacity	-	2 Kg Solid waste 20 – 30 Litres Waste Water
Volume of Digester	-	1000 Litres
Suitable for	-	3-5 member family
Space required for the installation	-	1.25 Sq Mtrs.
Gas generation per day	-	1 Cum Biogas
Liquid fertilizer	-	20 Litres per day
1 Cum Biogas	-	0.5 Kg. LPG
Annual income in the form of gas & manure	-	Rs. 12,000/-
Annual Biogas generation	-	365 Cum
Generation of 365 Cum Biogas	-	Emission reduction of 3.5 tone CO ₂
Revenue from CDM	-	3.5 credits/year

OPERATION OF PLANT - Bio Waste Materials from kitchen is collected in a bucket / dustbin along with organic waste water. It is poured in to the Inlet chamber of the plant. Bio Gas generated is

stored in the gas holder. The flow of gas from gas holder to the stove (Utilization Point) is made possible by opening the control valve on the gas holder

Portable Pre fabricated Plants: - BIOTECH had already designed portable plants for being used in places where installation of plants on the ground is not possible either because of hardness of the soil for excavating a pit or on account of high water rise grounds.

Eco friendly Toilets: - The Bio waste and night soil (human excreta) produced in the domestic household are converted into cooking gas . For the people living in coastal areas, marshy lands and high water table places, this type of toilets are suitable.

Institutional Biogas Plants-These type of plants are designed to cater to the needs of hostels, schools, convents, hospitals, industrial organizations etc. The wastes generated will be treated by hygienic waste disposal methods, in an eco friendly manner.

Night soil Biogas Plants

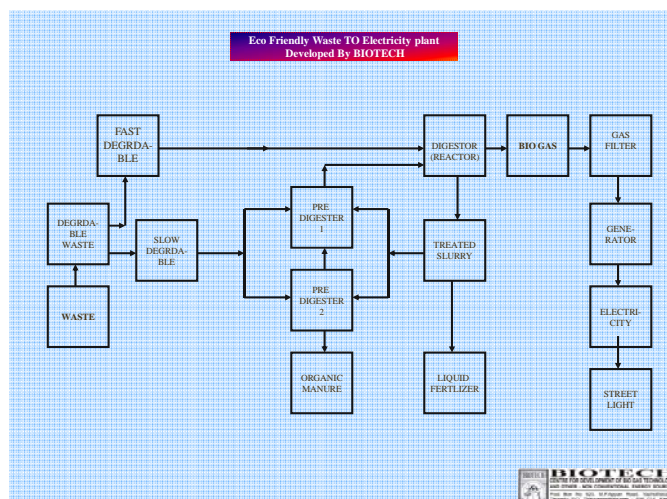
These types are used in Convents, Hostels, Hospitals, etc where people are coming in to stay occasionally. The night soil (human excreta) generated will directly be fed into the treatment plant automatically in a hygienic way for production of biogas.

Waste to electricity - Generation of Electricity from Biogas

1.5 KW electricity can be produced from one cubic metre of biogas. The size of the generator can be fixed depending upon the availability of gas, the quantity of gas and the duration for the requirement of the power.

The main advantage of waste to electricity project is that, no external power is required for the operation of the plant. The power generated in the treatment plant can be utilized to meet the in-house requirements completely. Excess quantity can be utilized for any type of application, like the street lighting, providing lights to the markets etc.

Operation of Waste to Electricity Plant



Bio manure

The treated bio waste materials coming out from the digester is in the form liquid. This is a very good fertilizer for all types of plants. Treated solid bio manure can also be collected directly from the pre-digester developed by BIOTECH. The bio manure generated through the bio waste treatment is a better substitute for chemical fertilizer. Through the utilisation of this, Lakhs of rupees spent for purchasing chemical fertilizers can be saved considerably.

History of waste to electricity projects in Kerala

The installation of Kerala's first bio waste treatment power generation plant was commissioned 8 years back at Pathanapuram Grama Panchayat in the Kollam District. This plant is treating 750 Kg of organic waste every day and generating 5 KW electric power daily. After the successful completion of the above project, several Grama Panchayats in Kerala State have come forward for the installation of such plants. BIOTECH had already completed the installation of 52 power generation projects using market / slaughter house wastes. The power generation capacities of these plants range between 3 KW to 10 KW. The power generated from these projects is being utilized for energy requirements of the concerned markets and to meet the in-house requirement of the plants.

Specialty of BIOTECH Waste to electricity projects

There is no need of grid electricity for the regular operation of the plant. A part of the power generated from the plant is being utilized to meet the in-house requirement of the plant. Introduction of anaerobic pre digesters helps to treat the waste completely and to collect the treated waste. It prevents the scum formation tendency of the plant. The inbuilt slurry loop systems accelerate the fermentation process and reduce the consumption of fresh water for the regular operation of the plant.

BIOTECH – Organizational Background

BIOTECH started functioning from 1994. The main activities include promotion, implementation, training, R&D, and also the creation of awareness to the people in the field of environmental protection, conservation of energy and production of renewable energy by waste management.

Different models of plants for the treatment of waste, according to the requirement of the consumers and nature of waste, have been developed by BIOTECH. These models cater to the needs of different categories of beneficiaries such as domestic households, public institutions like hospitals, schools, hostels, convents etc. and also Local Body Institutions like Panchayats, Municipalities, Corporations etc for treating different types of wastes. In recognition of our selfless services to the society BIOTECH was honored by conferring on it the prestigious International Ashden Award "GREEN OSCAR 2007".

SERVICES RENDERED BY BIOTECH

Technical Advice, Consultancy Service, Conducting Feasibility Study, Preparation of Projects, Implementation of Projects, Technical support for regular operation of the plants.

Joint venture opportunities with BIOTECH

The organisations establishing Joint ventures with BIOTECH will have the following benefits

- 1) Exclusive right for the implementation of projects in a particular area
- 2) Permission for using the Intellectual properties right owned by BIOTECH.
- 3) Technical support for project study, project preparation, project implementation and operation of waste to energy projects.
- 4) THE Joint venture organisations will obtain Technology transfer and Technical support for starting production centres in their areas of operation .
- 5) Training for the production / fabrication and installation of plants and projects .

We are of the view that if similar decentralized waste treatment plants are installed all over the country, it would be helpful to reduce the impact of climate change and also accelerate the production of biogas, electricity and bio manure apart from treatment and disposal of organic wastes.

More information about Bio energy projects are available with-

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