



Create savings on LPG & manage wet waste through Biogas



**Reduce LPG needs
up to 50%**





The Problem faced today:

The landfills of Bangalore are shutting down as the communities living near them, agitate against continuous dumping of waste. Source segregation is therefore necessary and is to become a bylaw. By segregation, what we find is that trash is no longer waste but a valuable resource. Plastics, paper and metal generate an income of minimum Rs.100/month by recycling. What about wet waste from our kitchen and left over meals that within hours starts to go foul and becomes smelly?

A Solution:

Portable Biogas digesters are provided as a solution that not only helps manage wet waste in a safe and hygienic condition but also displace a family's LPG needs by half. An average Indian family of 4 consumes one LPG cylinder a month, thereby 12 a year. According to the new government provisions made for LPG, only 6 cylinders will be available under subsidized rate of Rs.400 and the rest 6 will have to be purchased at a commercial rate of Rs.770-800. If Biogas is installed in homes, the family only has to spend Rs.2400 on the first 6 cylinders of LPG, the remaining 6 is taken care by biogas, resulting in an average savings of Rs.4800 a year. With about 1.1 sqm space, they can be placed in balconies, terraces, backyards, basements and gardens. Larger units are available for apartment complexes, hotels, restaurants and office buildings with an option of converting gas into electricity. The lifespan of a digester is about 25 years.

How does it work?

A biogas unit comes with a digester tank in which everyday kitchen waste gets digested by anaerobic bacteria that emit about 70% methane and other gases. This gas is stored within the upper chamber that floats in water. The gas is collected in the gas drum, which rises or moves down, according to the amount of gas stored. The gas drum is prevented from tilting by a guiding frame. If excess gas is produced, it is automatically released due to buoyancy ensuring safety. When the drum floats in a water jacket, it cannot get stuck, even in substrate with high solid content. As the gas rises, it passes through a gas pipe connected to a Biogas stove, similar to LPG stoves, and is ready for cooking. The input for the digester is one part kitchen waste and one part waste water that can be obtained from washing rice and dals. Once the entire mass gets digested, it is converted into a rich liquid manure which comes out of the outlet pipe and collected in a bucket. This can be used for gardens, potted plants or poured into the drain.



Myths and Facts:

Myth	Fact
It will stink up my house!	Ordour free set up and gas produced is combusted while burning
Biogas plants are unhygienic	Biogas is one of the safest ways to dispose organic waste. It does not attract any flies, insects and pathogens thereby reducing spread of diseases
It takes a very long time to be produced and requires regular cow dung input	Only once cow dung is to be used to create the starter culture and within 10 days, the unit will produced 1.5hrs of cooking gas everyday
It does not cook food like LPG	Customers say they feel no difference and extra large holes in the stove burner ensures a bigger flame
Large quantity of waste is required to make Biogas	As little as 1.5kgs of waste that is normally produced everyday in a kitchen, is sufficient to provide gas for 1.5-2 hrs of cooking a day
It is dangerous to keep at home	Unlike LPG cylinders, the pressure in the digester is less and therefore will not burst.

Domestic plant capacity

Plant capacity	0.5 cum	1 cum
Quantity of solid waste	1 ¹ / ₂ Kg	3 Kg
Quantity of liquid waste	5 Litres	10Litres
Gas output	1-1 ¹ / ₂ Hrs	2-2 ¹ / ₂ Hrs
Area required	1.2 square meter	1.2 square meter
Type of waste	Domestic Kitchen waste	Domestic Kitchen waste



Features:-

Water jacket

Water-jacket plants are universally applicable and easy to maintain. The drum cannot get stuck in a scum layer, even if the substrate has a high solids content. Water-jacket plants are characterized by a long useful life and a more aesthetic appearance (no dirty gas-holder). Due to their superior sealing of the substrate (hygiene!), they are recommended for use Very close to kitchen and even for night soil based plants.

Guide frame

The side wall of the gas drum should be just as high as the wall above the support ledge. The floating-drum must not touch the outer walls. It must not tilt, otherwise the coating will be damaged or it will get stuck. For this reason, a floating-drum always requires a guide. This guide frame must be designed in a way that allows the gas drum to be removed for repair. The drum can only be removed if air can flow into it, either by opening the gas outlet or by emptying the water jacket .These metals are coated with ISO resin which prevents corrosion

Stirring

Stirrers are provided in the gas holder in order to break the scum and to maintain the smooth running of the plant. If not stirred, the slurry will tend to settle out and form a hard scum on the surface, which will prevent release of the biogas.

This problem is much greater with domestic plant (vegetable waste) than with manure, which will tend to remain in suspension and have better contact with the bacteria as a result. Continuous feeding causes less problems in this direction, since the new charge will break up the surface and provide a rudimentary stirring action

Continuous feeding

The complete anaerobic digestion takes about 16 weeks at normally warm temperatures. Gas production can be accelerated and made more consistent by continuously feeding the digester with small amounts of waste daily. This will also preserve the nitrogen level in the slurry for use as fertilizer.

The advantage of continuous-feed plants is that the bacteria receive a regular supply of substrate and are therefore able to generate a more constant supply of biogas. The problem is that buoyant constituents tend to form a stiff layer of scum that impedes biogas production and may even plug up the plant. That drawback can be countered agitators (stirrers) inside the plant.
