

Frequently Asked Questions

What is the **BIOGASPRO**?

The **BIOGASPRO** is a biogas digester that integrates the treatment of your organic waste, sewage and wastewater. In so doing it produces energy in the form of gas (typically used for cooking) and liquid fertiliser that will dramatically improve your soil quality. Placed underground like a septic tank it is fed by an underground sewer pipe and via an exposed manhole cover, respectively. This system reduces wet waste being deposited in your dustbin (urban) and many daily hours of fuel wood collection (rural).

What is biogas?

Biogas is a natural gas comprised of 2/3 methane, 1/3 carbon dioxide and other trace gases such as hydrogen sulphide. The energy in the biogas is due to the methane.

How does it work?

Over time all biodegradable waste breaks down releasing methane, which is a potent greenhouse gas. This natural process is performed by groups of beneficial anaerobic bacteria that work together to transform waste to valuable outputs. By capturing the gas in the **BIOGASPRO** and burning it for cooking, the methane releases heat and carbon dioxide, reducing its greenhouse gas effect to one twentieth of what it was.

What is needed for a biogas system to work?

The bacteria in the system must be kept in an anaerobic (oxygen free) environment and be fed with suitable nutrients to thrive at ambient temperatures. Systems can be fed with human waste, separated organic (kitchen) waste, landscape off cuts and manures.

Who can use the **BIOGASPRO**?

- Lodges, hotels, conference centres, resorts
- Households and smallholdings
- Community Centres and institutions
- The Agricultural Sector

What is the minimum that I need to feed the **BIOGASPRO**?

1 kg of waste daily + 5 litres of water

What is the maximum that I can feed the **BIOGASPRO**?

The amount of solids depends on the feedstock type, and this information is detailed in the **BIOGASPRO** Product Datasheet. The maximum amount of water that can go into the **BIOGASPRO** is 1,000 litres per day.

What happens if I don't feed the *BIOGASPRO* for a while?

Gas production will slowly decrease as the bacteria start to die off. Once all the nutrients have been consumed all the bacteria will die and gas production will cease. The *BIOGASPRO* will have to be re-primed to get the process restarted.

Does it need special municipal approval?

Every municipality seems to have a different set of rules. However, generally speaking as long as it is incorporated in house plans and gets planning approval there should be no problem. Once you opt to use the effluent for irrigation more stringent approvals may be required. In the rural context there is increasing awareness of the value that a biogas system brings to households, and a number of projects are starting in 2010 to demonstrate these positive impacts.

What happens if you do not use the gas? Does it have a release valve?

Once the gas storage chamber is full the system will release the excess gas through a vent mechanism.

Is there a fire risk?

Naked flames must not be allowed anywhere near the *BIOGASPRO*. We advise that the area be kept clear of overgrowth and that clear signage is in place indicating flammable gas. This signage is supplied with the *BIOGASPRO* for placing at the digester and the point of use. For day-to-day operation of the gas appliance, health and safety norms apply.

Does the installation area need to be cordoned off?

Fencing off the area with a small enclosure would reduce the risk of both fire and someone falling in. The *BIOGASPRO* is supplied with locked manhole covers; the manhole covers must be kept locked to prevent children from falling in.

Can I overflow to the sewer?

Yes you can. This eliminates the possibility of using the effluent for irrigation and fertilizer thus lengthening the payback time (see below). However, it reduces capital costs upfront and sometimes is more appropriate in an urban setting.

Does it work without sewage?

Yes it does, provided some manure is used to introduce bacteria into the system initially. Thereafter they will perpetuate themselves.

What does it cost?

The entire (turnkey) installation in the Western Cape by registered installers and including gas and sewage connections, currently costs R35,000 excluding VAT with the price being subject to change from time to time. This information is further outlined in our '*BIOGASPRO* Proforma Offer'.

What is the payback period?

The payback on a system depends on a variety of factors, like capital cost, interest rates, the value of the energy and fertiliser being replaced, the amount and type of feedstock used. One of the following five scenarios should apply to your situation and give you an indication of the payback period:

Inputs & assumptions	
R39,900	price installed incl VAT
R20/kg (R25/kg rural)	retail price of LPG incl VAT (Dec 2009)
10%	increase in LPG and nutrient values/ann
R50/kg (100% NPK)	retail value of NPK (2:3:2)
12%	interest rate

Scenario inputs	Urban Scenario 1	Urban Scenario 2	Urban Scenario 3
No of people in household	4	4	4
Feedstocks:			
- sewage	Yes	No	No
- food waste	Yes	Yes	Yes
- grass silage (from 100m2 of lawn = 2.4 kg/day)	No	Yes	Yes
- additional feedstock (0.5 kg/day additional food waste)	No	No	Yes
Water (litres/day):	< 1,000	<1,000	<1,000
BiogasPro outputs use:			
- Gas	Yes	Yes	Yes
- Fertiliser	No	Yes	Yes
Scenario outputs			
m3/day biogas	0.24	0.72	0.92
hours burntime/day	0.5	1.4	1.8
kg/ann LPG equivalent	38	113	144
kg/ann 100% NPK equivalent	35	113	137
Years payback	19.5	5.0	4.4
Return on investment	1%	31%	36%

Scenario inputs	Rural Scenario 1	Rural Scenario 2
No of people in household	6	6
Feedstocks:		
- sewage	Yes	Yes
- food waste	Yes	Yes
- grass silage (from 100m2 of lawn = 2.4 kg/day)	No	No
- additional feedstock (40 kg/day cow manure)	Yes	Yes
Water (litres/day):	100	100
BiogasPro outputs use:		
- Gas	Yes	Yes
- Fertiliser	No	Yes
Scenario outputs		
m3/day biogas	1.41	1.41
hours burntime/day	2.8	2.8
kg/ann LPG equivalent	221	221
kg/ann 100% NPK equivalent	137	137
Years payback	6.3	3.7
Return on investment	24%	44%

What appliances can we run off the biogas? Can the biogas be used on LPG appliances?

Biogas has very different properties to LP Gas (LPG) and therefore cannot be used in LPG systems. We recommend that the most cost effective use of the gas is for cooking but it could be used for heating water through a biogas water heater or heating a room with a biogas heater. Generally, at the scale of the **BIOGASPRO**, using the biogas to generate electricity will not be cost effective.

What are the impacts of a biogas system?

The **BIOGASPRO** has a very positive household and environmental impact. For the **urban** home the consumption of fossil fuels (grid electricity, LPG) and related costs are reduced, and high-value fertiliser is produced. It is a passive, biological system that also reduces the massive quantity of waste going to landfill sites. The methane gas emitted naturally as waste decomposes is contained and used to produce energy preventing it being released into the atmosphere where it acts as a very powerful greenhouse gas.

In **rural** environments the **BIOGASPRO** helps to replace traditional fuels such as indigenous firewood and kerosene, and improves the respiratory health and safety of the community through their replacement. Systematic extension of biogas technology creates jobs while saving money and decentralising power generation and wastewater treatment. Time spent collecting firewood can now be spent elsewhere resulting in improved quality of life.

Does it need to be sucked out from time to time?

If used correctly there should only be a need for it to be cleaned out very infrequently. However, this will be necessary more regularly if sand, plastic, sanitary towels and other non-biodegradable items are allowed to clog up the system. Overloading with organic wastes will also lead to more frequent emptying.