



Frequently Asked Questions



What is the BiogasPro?

BiogasPro is a high-efficiency biogas digester designed by some of SA's leading biogas experts specifically for domestic- and institutional-scale installations. BiogasPro is an underground plastic tank that produces a combustible gas and liquid fertilizer by digesting sewage, kitchen waste, wastewater and similar organic materials.

Developed by AGAMA Biogas, we install a digester in two days. Within four weeks you will be cooking with your own biogas. Result: on-site energy (gas), irrigation water and fertilizer. Carbon emission reductions from avoided waste to landfill are an added bonus.

What is biogas?

Biogas is a natural gas comprising about 2/3 methane, 1/3 carbon dioxide and other trace gases such as hydrogen sulphide. The fossil fuel LP Gas (LPG) is about 60% propane and 40% butane. They have sufficiently different properties to require different appliances to operate. Biogas however, is compatible with Natural Gas appliances.

How does it work?

The BiogasPro enables anaerobic digestion of the organic materials (without oxygen). It is like a composting process, except that compost is produced by bacteria operating in the presence of oxygen (aerobic digestion). Anaerobic digestion in the BiogasPro is performed in water by different types of bacteria, and is more efficient and more manageable than the aerobic digestion in your compost heap. Our biogas digester retains all of the incoming nutrients and makes them available in the liquid leaving the system; a composting process can lose up to 70% of its nutrients to the ground and atmosphere.

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 (or 5%) 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 suitably well fed to thrive at ambient temperatures. It can be fed on human waste, separated organic (kitchen) waste, landscape off cuts (but only those that are not woody) and manures.

Who can use the BiogasPro?

- Lodges, hotels, conference centres, resorts, restaurants
- Households and smallholdings
- Housing developments/ townhouse complexes/ RDP housing developments
- Community centres and institutions
- The agricultural sector
- Rural homes

How much gas will the BiogasPro produce?

Production from the digester is very dependent on what it is fed, how much it is fed, the temperature it is operating at, and other contextual factors. You would expect a single BiosgasPro digester fed by a family of four, to produce between 1 and 2 hours of cooking time per day on a single large ring cooker.



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

Gas production will slowly decrease as the bacteria start to die off due to lack of food. 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. Many current users only throw in their food waste every third day or so, and have sufficient gas to meet their needs.

What happens if I don't use the gas? Does it have a release valve?

Once the 1,200 litre gas storage chamber is full, the BiogasPro releases the excess gas automatically through a vent mechanism. The system can store enough biogas to cook for over 1 hour twice daily.

What can I feed the BiogasPro?

Any organic matter that is not too large or solid is safe. Good examples include food waste, garden scraps and grass. Wood and bone may be organic materials but take far too long to digest. Avoid feeding these to the digester.

Non-organic items such as plastics, rubbers, glass, stone and metals simply block the digester, and contribute no biogas production or fertilizer. They must never be 'fed' to the digester.

Do I need to pre-process material before feeding it to the BiogasPro?

Try to reduce the size of feed materials, (about 5cm or less all round). This reduces your chances of blocking up the system. Like us, your digester thrives on a varied diet. Silage (store) large volumes of grass cuttings, leaves, crop husks etc, before feeding them little and often to the digester together with other waste. Feel free to contact AGAMA Biogas for specific advice, and refer to the product datasheet for loading information.

What is the minimum that I need to feed the BiogasPro?

A minimum daily average of 1kg of waste materials and 5 litres of water (eg: 3 kg waste materials and 15 litres of water every 3 days). This amount is readily available from an average household, and you will find that you have a lot more material, particularly water, that will go into the system – see the next question.

What is the maximum that I can feed the BiogasPro?

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

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 (e.g. more than 35 kg of food waste on a single day) will also necessitate more frequent emptying.

Will I have an ugly plastic tank in my yard?

No. The BiogasPro is an underground tank, with only 3 manhole covers visible above ground. The standard installation involving a sewer, has the inlet coming in at 380mm below ground level. We recommend that you cordon off the covers and/or ensure they are always locked, for safety reasons. It can in some unusual cases, be installed above ground if required.



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Does it take a long time to install?

In good soil conditions (no large rocks), a complete installation takes only two days (the fastest installation of a biogas system available anywhere). This means that you benefit sooner from gas and fertilizer outputs. Complicated installations (eg in rocky ground, with lots of subsurface services to be negotiated) can take a week.

Do you have different sizes of digesters to suit every situation?

Our digester comes designed with an optimal 6,000 litre volume. With a 2.2 m diameter and 2.4 m high it is convenient to transport, bury and operate. However, BiogasPro digesters may be connected in groups for larger installations like farms or industrial applications. Biogas experts from AGAMA will tailor the system to suit your application.

Does it need special municipal approval?

Every municipality has a different set of rules, and our determined clients have always received municipal approval. If the BiogasPro is incorporated in house plans no unusual approvals are needed above the normal building plans. However, should you opt to use the effluent for irrigation, more stringent approvals may be required. In the rural context there is increasing municipal awareness of the value that a biogas system brings. A number of rural projects are going ahead in 2010 that will demonstrate these positive impacts to a wider audience.

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 or children falling in. The BiogasPro is supplied with locked manhole covers, which must be kept locked to prevent children from climbing in.

Can I overflow to the sewer?

Yes you can. This does mean that you only use the gas and lose the irrigation water and fertilizer which lengthens the payback time (see below). However, it reduces capital costs upfront and reduces the complexity and time required for the full installation. It is often more appropriate in an urban setting. A secondary installation of a waste water treatment system can be done at some point in the future. Please contact AGAMA for recommendations.

Does it work without sewage?

Yes it does, provided some manure is used to introduce bacteria into the system initially. Thereafter the bacteria will perpetuate themselves, as long as the minimum feeding rate is maintained.

What does it cost?

The cost is dependent on a range of factors such as soil conditions (eg rocky conditions), water table, site complexity, length of sewer and gas lines, etc. This information is further outlined in our 'BiogasPro Proforma Offer'.



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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 gas and fertiliser being replaced, the amount and type of feedstock used. The important difference between BiogasPro and any other waste management system is that it does in fact pay for itself!

As an example, we have compared the financial cost-benefit of the BiogasPro with that of a conservancy tank used in an urban setting. The worst case scenario involves limited feeding and no use of the liquid fertiliser. The best case application involves a good loading rate *with* use of the liquid fertiliser. The best case outcome is that the BiogasPro starts saving you money relative to the conservancy tank, after just 2 years. The worst case is that you start saving money after 6 years. Either way you are better off eventually.

What appliances can we run off the biogas?

Whilst they are all gaseous hydrocarbon fuels, biogas is sufficiently different from LPG and Natural Gas to require different or adapted appliances.

AGAMA supplies cookers, water heaters, lamps and a range of other biogas appropriate appliances. We strongly recommend starting by using the biogas only for cooking, and then over time expanding your use if possible and appropriate. Using the gas for cooking is *the* most efficient use of the biogas, and is not complicated.

What are the overall 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 while high-value fertiliser is produced.

Being a passive, biological system it reduces the massive quantity of waste going to landfill sites. The methane gas emitted naturally as waste decomposes is contained and burnt, producing energy and carbon dioxide which is released into the atmosphere where it acts as a very much less powerful greenhouse gas.

In **rural** environments, the BiogasPro helps to replace traditional fuels such as indigenous firewood and kerosene improving the respiratory health and safety of the community through their replacement. The effluent helps rehabilitate the flora and improve soil quality, and strengthen food security.

Systematic extension of biogas technology creates jobs and saves money while decentralising power generation and wastewater treatment. Time spent collecting firewood can now be spent elsewhere resulting in improved quality of life.

Can I see a digester in action?

Yes, of course. Please contact AGAMA.

How do I get further information?

Please visit our website at www.biogaspro.com or call us on +27-21-7013364.