

# Energy and electricity **from waste**

**Biogas is a low cost form of energy derived from renewable 'waste' resources: animal manure, agricultural residues, industrial wastewater, human waste and other organic or plant materials.**

Biogas is produced when organic matter, such as animal manure or plant matter, is biologically broken down in the absence of oxygen. This anaerobic or fermentation process releases methane gas, carbon dioxide, ammonia and water vapour (moisture). These gasses are combustible and can therefore be used as fuel for heating, such as cooking, or in anaerobic digesters where it is generally used in a gas engine to convert the gas energy into electricity and heat.

Under normal circumstances, the huge amounts of manure produced on farms is more of a problem than a benefit and either gets dumped or sold to composting companies at relatively low prices. By installing a biogas digester system, the manure becomes an asset, producing practically free energy to generate electricity or heat.

## **How it works**

A simple biogas plant has a container to hold the decomposing organic matter and water (slurry), and another to collect the biogas. There must also be systems to feed in the organic matter (the feedstock), to take the gas to where it will be used and to remove the residue.

A biogas plant needs some methane-producing bacteria to get it started. Once the plant is producing biogas, the bacteria reproduce and keep the process going. A small amount of cattle dung is often used as the 'starter' for a biogas plant, even when it is not the main feedstock.

Rural families often use animal dung as the feedstock for a biogas plant. The dung from two to four cows (or five to ten pigs) can produce enough gas for all cooking and sometimes lighting too. The family needs to feed the plant once each day with a mixture of dung and water.

Food waste can also be used as the feedstock. Food waste breaks down and produces gas more quickly than dung, so the slurry does not need to be held for as long; these plants are therefore smaller and more suitable for urban homes.

## **Advantages of biogas on farms**

- It reduces the smell and ensures that there is always energy (particularly electricity) available on-site.
- Overflow water or slurry, a residue from the process, is a high-grade fertiliser that can replace expensive mineral fertilisers, in particular nitrogen.
- It provides an integrated system for energy production, fertiliser production and waste treatment.



## Benefits of producing biogas

Produce your own energy from farm waste (manure and wastewater) by using a biogas digester.

**Waste management:** Reduces heaps of manure that are a breeding place for flies and bad smells.

**Energy security:** Produces biogas to be used for gas appliances and generating electricity.

**Save on fertiliser:** Use the slurry from the overflow as liquid fertiliser for your crops.

## Die voordele van biogas produksie

Maak jou eie biogas uit plaasafval (mis en water) met 'n bioverterder.

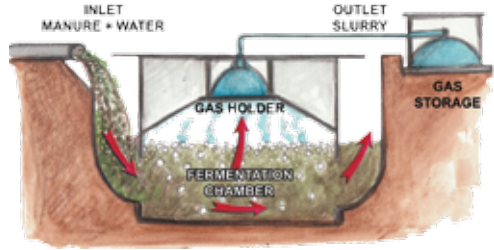
**Afval beheer:** Dit verminder afvalhope waar vlieë broei en wat slegte reuke veroorsaak.

**Energie versekering:** Dit produseer biogas wat gastoestelle kan laat werk en elektrisiteit opwek.

**Bespaar op kunsmis:** Gebruik die reste uit die bioverterder as vloeibare kunsmis vir aanplantings.

## Izinzuzo zokukhiqiza i-biogas

Yenza umkhiqizo wamandla ngokwakho usebenzisa indle yasepulazi (ubulongwe namanzi angcolile) ngokusebenzisa i-bio-digester.



**Ukuphatha indle:** Kwehlisa ubulongwe

obuningi okuba yindawo yokuzala yezimpukane kanye namaphunga amabi.

**Ukuphepha kwamandla:** Kwakha i-biogas ukuze isetshenziselwe izinto zokusebenza nge-gas kanye nokukhiqiza ugesi.

**Londoloza ngomanyolo:** Sebenzisa umbhaceko kusuka kulokho okuchithekayo njengomanyolo wezitshalo zakho.

**Yenza imali:** Thengisa umbhaceko owomile njengomanyolo.

## Amancedo avela ekuvelisweni kwegesi evela kwizinto ebeziphila ezingasaphiliyo

Zenzele owakho umbane kwinkunkuma yasefama (umanyola namanzi amdaka) ngokusebenzisa i-bio-digester.

**Ulawulo lwenkunkuma:** Kwehlisa iingqumba zikamanyola ezihlala iimpukane kwaye ezinuka kakubi.

**Ukufumaneka kombane:** Ukukhutshwa kwegesi evela kwizinto ebeziphila ezingasaphiliyo zezixhobo zegesi kunye nokwenza umbane.

**Londoloza kwisichumiso:** Sebenzisa udaka oluphuphumayo njengesichumiso esilulwelo kwisilimo sakho.

**Ukwenza ingeniso:** Ukuthengisa udaka olomisiweyo njengesichumiso.

## Melemo ya ho hlahisa biogas

Hlahisa eneji ya hao ka matlakala a polasing (moitedi le metsi a dikgwerekgwere) ka ho sebedisa bio-digester.

**Taolo ya matlakala:** E fokotsa diqubu tsa moitedi tse ka bang dibaka tse hlahisang ditshintshi le monkgo o mobe.

**Tshireletso ya eneji:** E hlahisa biogas e tla sebedisa bakeng sa disebediswa tsa kgase le ho hlahisa motlakase.

**Boloka ka menontsha:** Sebedisa metso a seretse a nang le mantle a diphoofole ho tswa phallong jwalo ka monontsha o metsi bakeng sa dimela tsa hao.

**Etsa kuno:** Rekisa seretse se nang le mantle a diphoofole se ommeng jwalo ka monontsha. [UM](#)