

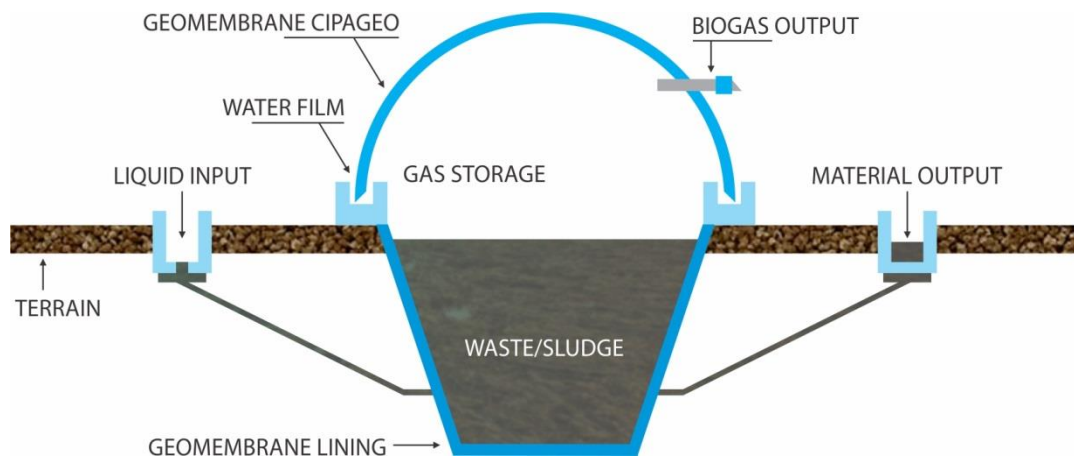
Case Study on Biodigester

What is a biodigester?

A biodigester is a system, much of them of simple assembling, designed to recycle the waste of biomass and turn it into biogas and biofertilizers.

During history, the human being always introduced natural fertilizers into agriculture, in order to raise productivity of the crops. The development of agribusiness and its related technologies, together with the demand for cheaper and renewable sources of energy, fostered the development of more productive biodigester systems.

The design of a typical system is shown in the Figure 1.



The waste is introduced into the pond. Bacteria process anaerobically the material and the final output is biogas (around 45% methane and 35% carbon dioxide), which can be used as a source of heat and electrical power. And also a 'sludge' that can be used as biofertilizers.

The advantages of a biodigester are:

- Production of biogas, which provides significant reduction on the use of energy and fuel.
- Production of biofertilizers.
- Reduction of the volume of solids, decreasing the cost of logistics on the crops.



- Reduction of odors and insects on the property and spread of diseases.

The Economics of Biodigesters:

A biodigester has to be considered as an investment project. An initial financial resource has to be returned by a hurdle rate defined by the owner. Our model consists on the following assumptions:

1. Size of biodigester: 17x50x3,5 meters
2. Initial Investment: US\$ 40.000,00
3. Feed Stock Size and methane output
 - a. 300 Porks produce 450m³ of biogas per day
 - b. 200 Cows produce 240m³ of biogas per day
4. Total biogas daily production of 690m³ runs a 150KVA power generator for 16 hours. We considered production of 100KWh. Cost of KWh at US\$ 0,11.

We can derive two sources of revenues:

ENERGY: Revenue per hour is US\$ 11 . Considering 16 hours per day, we reach US\$ 176 per day and US\$ 5.300 per month.

BIOFERTILIZERS: Every country has its own fertilizer prices. The revenues on fertilizers sales/savings must be considered as an upside in the analysis.

The energy estimated monthly savings of a biodigester is around US\$ 5.300,00. In 7 months, the return on this capital can be achieved. By adding the fertilizers, revenues can be achieved even earlier.



Case Study – COWPIG SLAUGHTER HOUSE

Cowpig is a small size slaughter house located 100km from the city of Sao Paulo.

Its daily production output is 11 tons of pork meat and 51 tons of beef. One biodigester of 17m width x 50m length x 3,5 depth needs 900 porks in confinement to be run.

The construction of the biodigesters followed 3 steps:

Step 1- The pond was excavated and a reinforcement concrete rings was done on the borders.



Step 2: Installation of Cipageo TEXTIL 1,00mm plus a Geotextile reinforcement as liner.



¹ Price at spot market in Brazil.

Step 3: Installation of the cover with Cipageo BIO 1,00mm double faced white/black



Step 4: Introduction of the wastes and kickoff



The biogas is used as fuel to the boiler machines. The steam is used in the production process of Cowpig.

The result is savings of around US\$ 7.000 dollars in energy costs. The payback of the investment was done in 6 months.



Cipatex on Biodigesters

Cipatex is one of the leading geomembrane and geotextiles manufacturers in the world. We provide a package of products and services that can enable you to successfully perform in your biodigester projects.

Cipatex materials used in biodigesters are the Cipageo® TEXTIL and BIO PVC geomembranes with internal reinforcement, which provides both controlled elongation and high resistance.