

Case Story

Bio2Watt, South Africa

LOCATION/YEAR

Johannesburg, South Africa, 2015

PLANT PERFORMANCE

Input capacity

Approx. 275,000 tons/year of biomass, consisting of cattle manure, chicken litter, potato waste and a mix of products from dairy industry (yoghourt, ice cream etc.).

Output capacity

Biomethane: 7,700,000 m³/year

AREA

Approx. 16000 m²

LEAD TIME

Building (biogas plant)

9 months for construction and 3 months for commissioning.

Total project

24–36 months.

VIDEO

Watch a video from the biogas plant [Bronkhorstspruit Biogas Plant](#).

CONTEXT/HISTORY

Following the signed power purchasing agreement with energy company Bio2Watt (Pty) Ltd in 2014, BMW South Africa received the first green energy at its Rosslyn Plant in Pretoria on 10 October 2015. This agreement means that 25–30% of the Bio2Watt Rosslyn Plant's electricity requirements will be generated from renewable sources. The BMW South Africa / Bio2Watt renewable energy partnership is the first commercially viable biogas project.

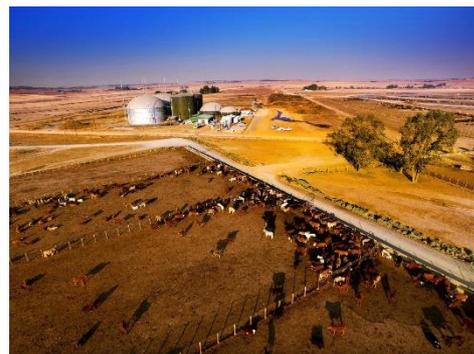
Combigas was asked to provide a specification and proposal for the biogas plant that would process both agricultural and industrial waste, such as dilute water, cattle manure, chicken litter, potato waste, yogurt, ice-cream etc.

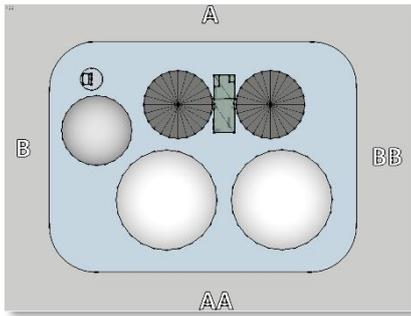
In close collaboration with local EPC contractor Bosch Projects,

Combigas delivered engineering works and consulting within design, dimensioning,



implementation, project management and support of a biogas plant including a CHP unit to generate electricity.





Layout Overview



Construction of Reactor Tanks

APPLIED TECHNOLOGY

The plant utilises different types of waste. The calculations are based on standard figures for these products. It may be adjusted, when composition of the input is known.

The gas production is calculated for each type of biomass using Danish standard figures (GVS = production of methane per tonne of organic dry matter).

The biomasses are suitable for digestion and based on the content it is ascertained that the biomass can be digested in thermophilic conditions (digestion at 50–53 °C).

The digesters have an active volume of 27,700 m³, which means that the retention time is 37 days.

The gas will be utilised in a gas engine for production of electricity and heat.

The electricity is sold to the grid. A part of the heat is used for fermentation process.

The plant was designed for the production of 4 MW of electricity.

SCOPE OF DELIVERY (FROM DENMARK)

Mix Tank

Net capacity is 2,000 m³

Primary digester (qty. 2)

Each tank has a volume of 5000 m³.

Secondary digester (qty. 2)

Volume = 8907 m³ each.

Other equipment

- Switchboard and wiring for controls systems.
- Control system for automatic plant operation.
- Commissioning and performance test.

INVESTMENT COSTS

CAPEX

Cost of supply and installations as described above of approx. 8 million Euro.

OPEX

Approx. 10% per year.

LESSONS LEARNED

The building of this kind of projects involves not only the sale and implementation of technology, it also involves the transfer of knowhow at various levels.

General experience and the allocation of resources for training and education of the local workforce must be taken into consideration when it comes to biogas technology and applied science.

This is done to ensure the optimal and sustainable operation of biogas plants.