

Biogas plant “Wolfring Biogas Plant“

The Family Graf zu Eltz biogas plant was planned and built by the Rücken Engineering Office, Neukirchen, Bavaria, in 2002 in Fensterbach, Schwandorf County, Bavaria. The plant was connected to the local electricity grid in November 2002. In March 2004, the biogas plant was expanded with an additional fermenter with 1000 m³ effective fermentation volume; a permanent storage tank with 2,000 m³ storage volume and a gas-tight cover was under construction during the specialist jury onsite inspection.

The zu Eltz Family farming operation, along with potato and grain breeding, a fallow deer and red deer paddock with direct marketing and an adjoining garden market, is focused on energy production from regenerative energy sources.

In the Wolfring biogas plant, along with solid chicken manure, renewable raw materials maize silage, grain whole-plant silage and CCM-meal are fed in. The operation's fish pond water is used to provide the liquid.

The controlled variable here for the water feed volume is the N-concentration in the fermenter contents.

The solid chicken manure is delivered to the biogas operation free of charge by a cooperation partner, the maize silage is purchased for 17 €/t ex field plus harvesting, chopping and stacking costs. The whole-plant silage is self-produced; the CCM meal is procured free-farm.

The fermentation remnants are handed over cost-free ex-storage to the substrate-provision companies or applied on the own fields.



Photo:
Carl Graf zu Eltz

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Biogas Regions Shining Example



key data

Start of Operation	2002
Planning/ Construction.....	Ingenieurbüro Rückert
Operator.....	Carl Graf zu Eltz
Amount of gas produced	2,19 Mio m³ per year
Cost	1.700.000 Euros

feedstock

Chicken manure (spelt chaff litter)	500 tons per year
Corn Maize silage	500 tons per year
Grass cuttings.....	500 tons per year
Whole plant silage (grain, rape, sunflowers).....	2.500 tons per year
Silo maize silage.....	6.000 tons per year

60% own production, 40% purchase

Strategy for substrate procurement:

- Close, good contacts with surrounding farmers
- Ratio procurement – own production 40:60
- Parcel exchange – annual lease - cultivation contracts
- Free delivery of manure and fermentation substrate to the suppliers
- Inter-organisational machine use
- Participation in the machine community
- Procurement through dealer (corn maize coarse meal)

production data

Available area for the output of the biogas fertilizer	150ha
Thermal power of the gas engine	421 kW
Electric power of the engine.....	330 kW
Generated thermal energy.....	4,504 Mio kWh/a

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Utilisation of heat	:
20% green houses	
10% houses	
10 % paintshops	
5% corn drying	
15% woodchips	
10% home requirements	
Generated electric energy	4,47 Mio kWh/a
Power consumption (electricity) of the plant itself	223.500 kWh/a
Annual delivery of electricity to the (regional) electric grid company	
	4,4 Mio kWh per year
Electric grid company.....	EON Bayern

technical plant description

Horizontal fermenter, feed with briquetted cobs.....	650 m³
Horizontal fermenter, feed with snail.....	900 m³
2 Paddle-type agitators	
Re-fermentation vessel (round) (concrete ceiling).....	1.800 m³
2 Hydraulic propeller mixers	
Manure storage (open).....	4.500 m³
Gas accumulator foil sack with desulphurization.....	250 m³
External desulphurization with Biosulfex from ATZ	
Activated carbon filter	
Screw-extruder separator	
BHKW Jenbacher gas motor	

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Operating temperature.....**40°C**
 Residence time in the digester ~ **90 days**
 Average expenditure of human labour **5 hours** per day



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