

## Biogas plant „Ebersdorf“ Biogasanlage Niederl – Ebersdorf

The Niederl family operates a pig breeding and pig fattening business (250 breeding pigs) as well as a stable furnishing company in the community of Poppendorf. Since the beginning of 2004 they also operate a biogas plant that uses renewable resources and the liquid pig manure. The biogas plant of the Niederl family is characterised by the two horizontal high performance fermenters (400 m<sup>3</sup> each) with paddle stirrers. This system is unique in all of Styria. Maize, sugar beet chips and corn cob mix are mixed in the mixing pit (25m<sup>3</sup>, filled twice a day), a part of the substrate is extracted on an hourly basis and added to the horizontal fermenter. The liquid pig manure is automatically pumped from the neighbouring pigpen into the slurry store (100 m<sup>3</sup>) of the biogas plant. The liquid pig manure from the slurry store as well as the substrate from the mixing vessel is continuously added to the horizontal fermenter. A continuous removal into the two post fermenters (1,200 m<sup>3</sup> each) also takes place which ensures that the horizontal fermenters always have the same amount of substrate for fermentation and always run at the maximum biological capacity. In this system this leads to a better decomposition of the substrate and a higher biogas yield. The substrate remains in the EUCO-fermenters for about 10 days and for further 20 days in the post fermenters at a fermentation temperature of 40 – 42°C. The post fermenters are equipped with inclined and submersible motor agitators which ensure the proper mixing of the contents in the fermenter. The produced biogas is stored in two gas holders (400 m<sup>3</sup> each) above the two post fermenters and converted into electricity and heat using two gas engines (170 kW<sub>el</sub> and 330 kW<sub>el</sub>). The generated thermal energy is used to heat the own business (residential house, agricultural buildings), a further possibility for using the heat is already being planned. The electricity generated through co-generation is fed into the public grid. After the fermentation process, the “biogas manure” is open enough to be spread on the own fields as well as on areas owned by cooperating farmers (200 ha total) in a nutrient rich and minimal smell nuisance causing way. By doing this the family is able to save commercial fertilisers causing for the cycle to close itself.



Biogas Plant Ebersdorf © LEA

*Alois Niederl (operator)*

*“A further expansion of my pig breeding and fattening business is no longer possible; the full potential has been tapped. That’s why I started looking for an economically and ecologically viable alternative for the expansion. The decision to build and operate a biogas plant was also made because of the environmental aspects. The fermented “biogas manure” can be directly spread in a nutrient rich way with minimal smell nuisance on the own fields. This leads to the reduction of the use of commercial fertiliser and for the added value to remain in the agricultural sector. I am very pleased with the nicely working system of my biogas plant that is unique in Styria.”*

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# Biogas Regions Shining Example



## key data

Start of Operation .....	<b>2004</b>
Type of corporation.....	<b>sole proprietorship</b>
Amount of gas produced .....	<b>approx. 6700 m<sup>3</sup> per day</b>
Investment costs .....	<b>1 650 000 €</b>

## feedstock

Liquid manure (pig).....	<b>5760 m<sup>3</sup> per year</b>
Maize silage .....	<b>6480 m<sup>3</sup> per year</b>
Corn-cob-mix .....	<b>1440 m<sup>3</sup> per year</b>
Sugar beet chips.....	<b>4320 m<sup>3</sup> per year</b>

## production data

Available area for the output of the biogas fertilizer .....	<b>200 ha</b>
Generated thermal energy .....	<b>5 400 000 kWh/a</b>
Utilisation of heat .....	<b>Residential house agricultural buildings further use planned</b>
Electric power rating of the gas engine .....	<b>170kW, 330 kW</b>
Generated electric energy.....	<b>4 300 MWh per year</b>
Power consumption (electricity) of the plant itself .....	<b>7% of production</b>
Annual delivery of electricity to the (regional) electric grid company .....	<b>4 000 MWh per year</b>

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## technical plant description

Clamp silo .....	<b>2x7000 m<sup>3</sup></b>
Digester .....	<b>2x400 m<sup>3</sup></b>
Second digester .....	<b>2x1200 m<sup>3</sup></b>
Gas storage tank .....	<b>2x400 m<sup>3</sup></b>
Slurry tank.....	<b>3 600 m<sup>3</sup></b>
Mixing vessel.....	<b>25 m<sup>3</sup></b>
Residence time in the digester .....	<b>~ 30 days (10/20)</b>
Temperature of the anaerobic digestion (operational) .....	<b>40 - 42°C</b>
Average expenditure of human labour .....	<b>4 hours per day</b>

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