



### Biogas plant „Bioterm d.o.o.“ Letuš - Slovenia Ltd company

The family farm owned by Anton Flere comprises 36 ha of own and hired land and 90 head of cattle. In 2003 a biogas plant which is still in the phase of expansion started to work on the farm. Biogas is produced from cattle manure, organic wastes from kitchen and leftovers from the processing of milk in dairy plants. At the beginning phase there were two smaller engines for the production of electricity and recently they have built a third one.

Cattle manure from the stable comes into reinforced concrete sump (mixing tank) of 25 m<sup>3</sup> volume, together with organic wastes from kitchen which had been previously thermically treated and ground.

Substrates are mixed by a mixer and conducted into digester of 300 m<sup>3</sup> volume and second digester of 300 m<sup>3</sup> volume at 36° temperature. The process goes on from 60 to 80 days.



In 2007 the biogas plant was enlarged. A new reinforced concrete digester of 290 m<sup>3</sup> volume and second digester

of 400 m<sup>3</sup> volume were built. In the first one the substrate remains 40 days, biogas is produced at 36°C, in the second one the substrate remains 20 days at 55° C temperatures. All the substrate from the older digester and older second digester and from the new digester goes in the new second digester at 55 °C.

The final tank for the processed manure is made of reinforced concrete and has a 1500 m<sup>3</sup> volume. The processed manure as a more environmental friendly manure is applied on their own and hired fields, and on the fields of other farmers who do not have organic fertilisers.

*Anton Flere (operator)*

*“After the initial difficulties the production of biogas and electricity has become more stable. The treated manure causes lesser smell; nevertheless, from time to time the problems with neighbours still occur. I am also considering other alternative energy sources and I am very enthusiastic about building my own wind power plant.”*

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# Biogas Regions Shining Example



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Biogas is kept in gas storage tank (air bag gas storage) of 90 m<sup>3</sup> volume. At the beginning of operation of biogas plant two engines of 60 and 62 kW were installed. This year a new and more powerful engine of 150 kW was installed. The farm has also a system used for thermic treatment organic wastes from kitchen.

They decided to build a biogas plant because of bad smell caused by liquid manure which disturbed the neighbours when applied. The price of the construction up to now is essentially higher than the initial investment plan. The biogas plant will be expanded in future.

## key data

Start of Operation .....	<b>2003</b>
Type of corporation.....	<b>Ltd company</b>
Amount of gas produced .....	<b>1500 m<sup>3</sup> per day</b>
Investment costs .....	<b>1 000 000 €</b>

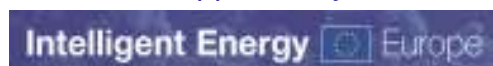
## feedstock

Liquid manure (cattle) .....	<b>2200 m<sup>3</sup> per year</b>
House organic waste.....	<b>2000 m<sup>3</sup> per year</b>
Dairy rest.....	<b>180 m<sup>3</sup> per year</b>

## production data

Available area for the output of the biogas fertilizer .....	<b>76 ha</b>
Thermal power rating of the gas engine .....	<b>140 kW</b>
Generated thermal energy.....	<b>1 226 400 kWh per year</b>
Utilisation of heat .....	<b>heating of digestors stable living house for thermal treatment p</b>
Electric power rating of the gas engine .....	<b>60 + 62 + 150 kW</b>
Generated electric energy .....	<b>754 000 kWh per year</b>
Power consumption (electricity) of the plant itself .....	<b>74 000 kWh per year</b>
Annual delivery of electricity to the (regional) electric grid company	

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**680 000 kWh per year**

District heating network ..... **No**

## technical plant description

Digester ..... **290 +300 m<sup>3</sup>**  
 Second digester ..... **300 + 400 m<sup>3</sup>**  
 Gas storage tank ..... **90 m<sup>3</sup>**  
 Residence time in the digester ..... **50 – 60 days**  
 Temperature of the anaerobic digestion (operational) ..... **36°C (new second digester 55°C)**  
 Average expenditure of human labour ..... **2 – 3 hours per day**



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