



# ProEcoPolyNet

## Best practice Sheet

### "Biogas CHP in Kössen"



Figure 1, Biogas plant from "MUT" company in Kössen/Tyrol (Picture: "MUT" company)

#### General Information

The biogas CHP, which is operated by the disposal company "MUT", is located in the village Kössen in the region of Kitzbühl (Tyrol).

In 2006 the biogas plant was built on a biomass composting area. It generates biogas with organic waste provided from the region's gastronomy and private households.

The generated biogas is used to operate a CHP unit (183 kWth/150 kWel) from "etaone" company, which produces thermal energy and electric power. The thermal energy is used for the fermentation process and to dry wood chips. 10 % of the electricity is used for the operation of the plant. The rest is fed into the public grid. The remaining ferment is used to manure agricultural fields.

#### Description of Technology and Operating Principle

For economical reasons the construction of the biogas plant was split into two stages.

During the first construction stage, which was completed in 2006, the following plant components were set up:

- (i). A receiving hall for the delivery of the organic waste
- (ii). A biogas fermenter with a volume of 680 m<sup>3</sup>
- (iii). An after-fermenter with a volume of 380 m<sup>3</sup> and a

#### Description of Technology and Operating Principle

- liquid manure dump with a volume of 70 m<sup>3</sup>
- (iv). A storage tank with a volume of 2200 m<sup>3</sup> for remaining ferment in the winter period
- (v). A CHP unit with an electric power output of 150 kW and a thermal output of 183 kW

During the second construction phase the following components will be installed additionally:

- (i). A biogas fermenter with a volume of 680 m<sup>3</sup>
- (ii). A storage tank with a volume of 2200 m<sup>3</sup> for remaining ferment
- (iii). A CHP unit with an electric power output of 100 kW

The second construction stage is intended to be completed in June 2008.

After completion of the second construction phase a biogas amount of around 101.76 Nm<sup>3</sup>/h is expected to be produced by using 5,750 tons of organic waste per year. Its energy will be used to operate the two installed micro CHP units.

#### Technical Characteristics of Installation

Table 1, Expected utilized organic waste and generated biogas amount per year after the completion of the second construction phase (Source: "Finsterwalder Umwelttechnik" company)

Ingredient	[t/a]	Biogas [Nm <sup>3</sup> /h]
Kitchen waste	4200	84,3
Liquid manure	700	1,76
Edible oil and fat	50	2,0
Corn	700	12,0
Others	100	1,7
<b>Total</b>	<b>5750</b>	<b>101,76</b>

Table 2, Technical data of biogas CHP module (eco 150 bio) from "etaone holding" company (Source: www.etaone.com, April 2007)

<b>ECO 150 bio</b>	
Max. thermal output [kW]	183
Max. electric power output [kW]	150
Fuel consumption on average conditions [kWh /h]	419
Electric power efficiency [%]	37,6



Figure 2, Installed biogas CHP module (150kWel/ 183kWth ) from "etaone holding" company (Picture: MUT company)

has a lower viscosity which is an advantage when manuring the agricultural fields.

Overall the implementation of the biogas plant can be seen as a good solution from a financial, a technical and an ecological point of view.

### Contact and Further Information

Etaone holding GmbH, A-7311 Neckenmarkt, www.etaone.com, April 2007

Finsterwalder Umwelttechnik GmbH & Co.KG, D-83233 Bernau, www.fitec.com, April 2007

MUT waste treatment GmbH, A-6330 Kufstein/Tyrol, www.juely.at/221.0.html, April 2007

Austrian Energy Agency, A-1060 Vienna, www.energyagency.at, March 2007

### Operational Data

The installed biogas CHP system is in operation since November 2006. Till the end of February 2007 the system was running in part load operation.

Since March 2007 the system has been running in full load operation.

### Benefits

Before the set up of the biogas plant in 2006, the composted organic waste was only used to manure agricultural fields and its naturally produced biogas wasn't used at all.

Now the biogas plant produces electricity and thermal energy with the naturally produced biogas. Due to the fact that only 10 % of the produced electricity is necessary to operate the plant, the biogas plant can also supply the public grid by feeding in electricity. Moreover only 50 % of the produced thermal energy is needed to run the fermentation process. For this reason, additional revenues can be achieved by using the produced thermal energy to dry wood chips.

The remaining ferment also produces less odour and

1 Based on the lower heating value