

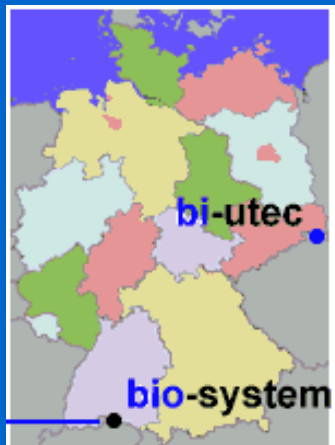
Organic Waste and Wastewater  
Treatment in Biogas Plant



- Waste and Wastewater Problems
- Anatech<sup>®</sup> Solutions
- Applications

- 
- 
- 

# Treatment of Organic Waste And Wastewater



# Benefits of Anaerobic Process

- Eliminates Air and Water Borne Pathogens
- Eliminates Odors
- Reduces Greenhouse Gas Emissions
- Renewable Energy
- By-product includes Organic Fertilizer
- Ease of Operation
- Enhance Environmental Stewardship

# Renewable Energy

- Anatech<sup>®</sup> converts organic waste into Biogas and organic fertilizer and feed.
- Biogas is a mixture of methane (75%) and carbon dioxide (25%).
- It is a high grade fuel which has the energy equivalent of 23.4 MJ/m<sup>3</sup> or 6.5kWh/m<sup>3</sup>.

# Energy Output

Waste Stream	Dry Matter	Biogas Yield	Electricity
Pig Manure	4%	20 m3	39 kWh
Cattle Manure	8%	21 m3	41 kWh
Corn	30%	190 m3	367 kWh
Household Biowaste	20%	130 m3	250 kWh
Food and Kitchen Waste	18%	110 m3	213 kWh
Kitchen Waste with Grease	20%	630 m3	1218 kWh
Sewage Sludge	22%	240 m3	464 kWh

# Economics of Waste Recycling

A typical municipal plant with a capacity of 60,000 metric tonnes of waste per year cost approximately \$42 per ton to treat, without the sale of substitute fuel or fertilizer.

## Input

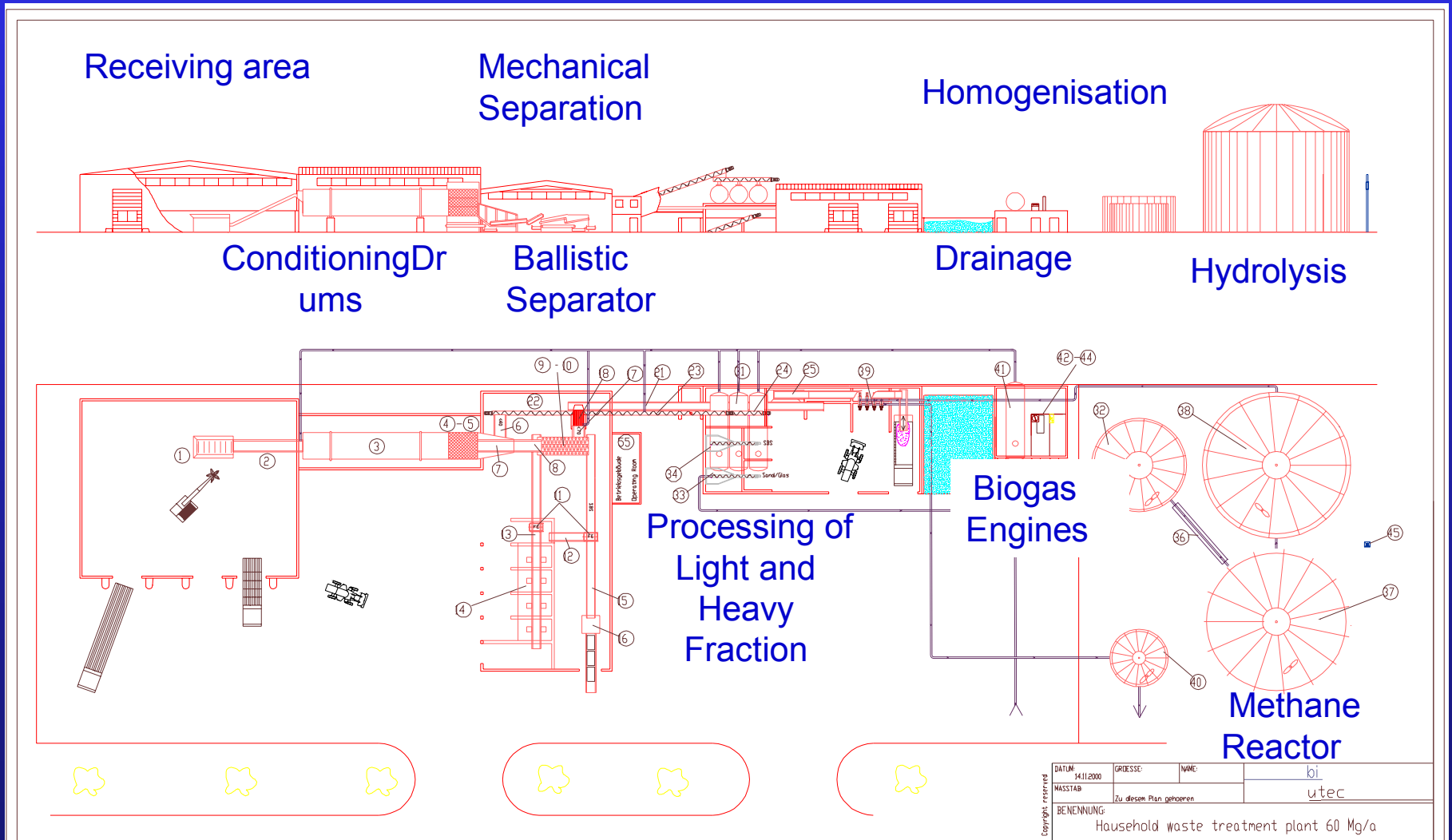
Degradable Organic Waste	40%
High Calorific Fraction	35%
Residual Waste	22%
Ferrous and nonferrous metals	3%
<b>Total:</b>	<b>100%</b>

# Economics of Waste Recycling

## Output

Heavy Fraction	13,000 metric ton
Metals	1,800 metric ton
Light Fraction (Substitute Fuel)	21,000 metric ton
Compost	14,000 metric ton
Heat and Electricity	820 kW/hr
Energy Consumption from Process	270 kW/hr
<b>Excess Energy</b>	<b>550 kW/hr</b>

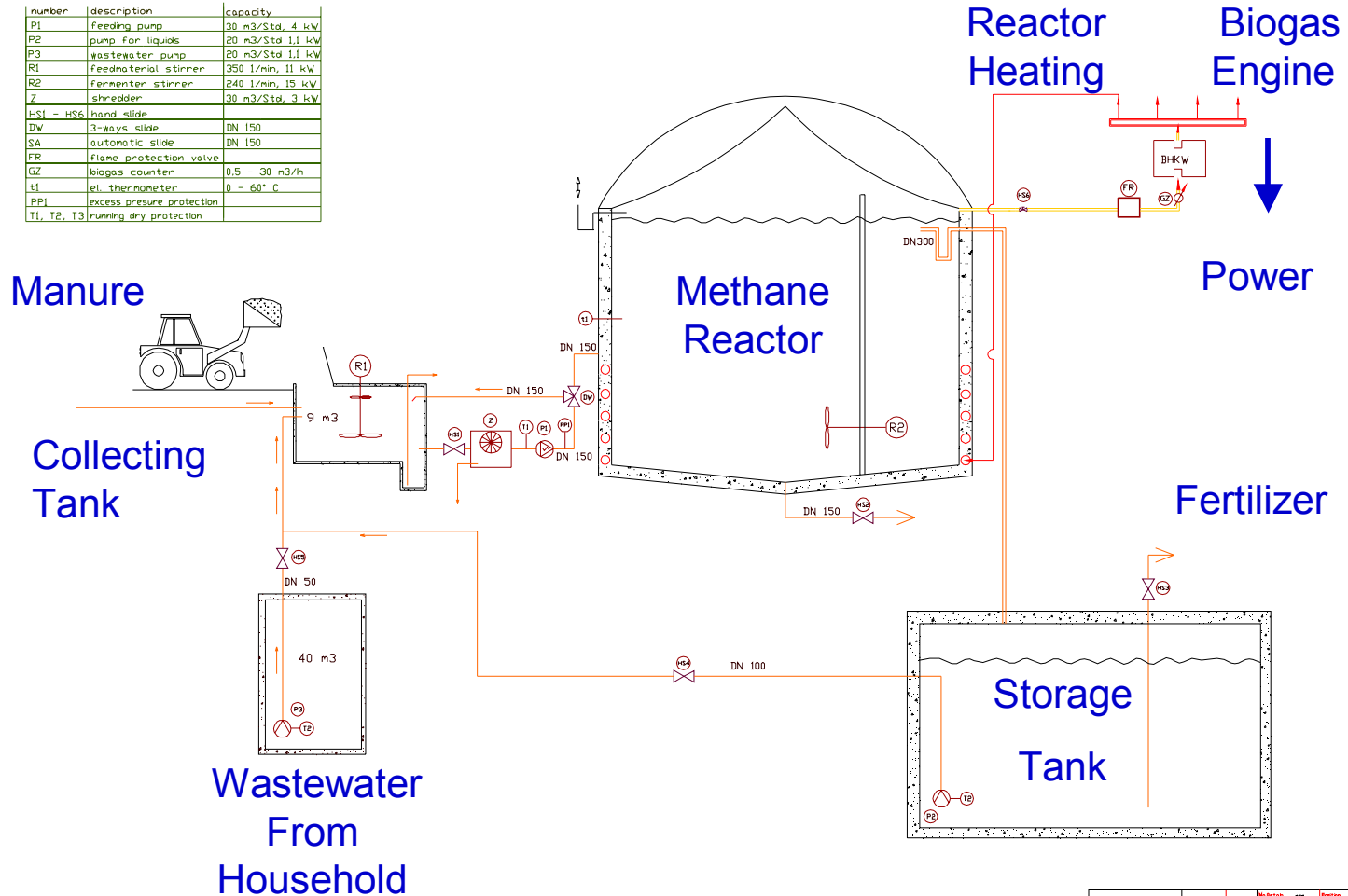
# Recycling of Domestic Waste





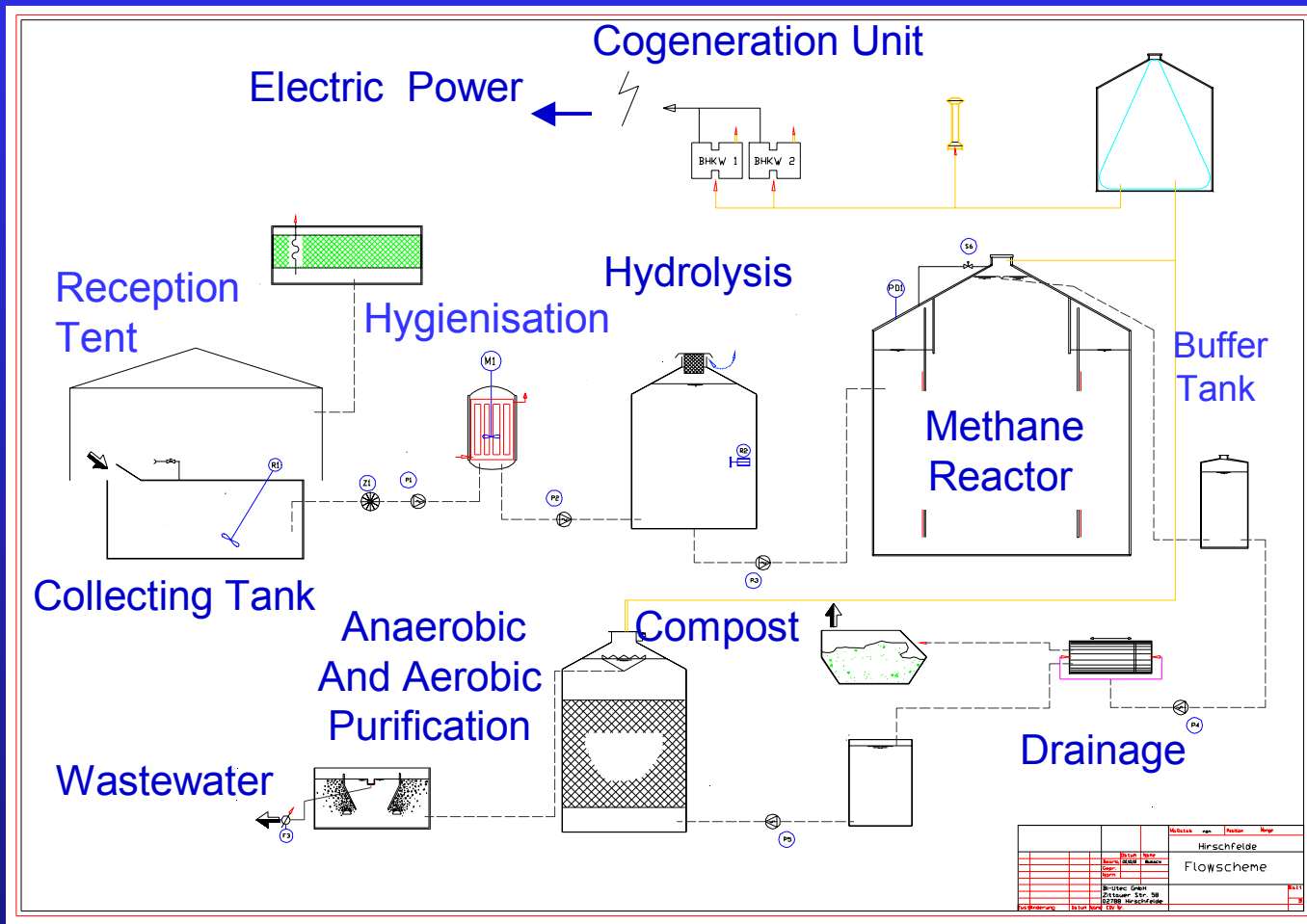
# Agricultural Biogas Plant

number	description	capacity
P1	feeding pump	30 m <sup>3</sup> /Std. 4 kW
P2	pump for liquids	20 m <sup>3</sup> /Std. 1.1 kW
P3	wastewater pump	20 m <sup>3</sup> /Std. 1.1 kW
R1	feedmaterial stirrer	350 l/min, 11 kW
R2	fermenter stirrer	240 l/min, 15 kW
Z	shredder	30 m <sup>3</sup> /Std. 3 kW
HS1 - HS6	hand slide	
DW	3-ways slide	DN 150
SA	automatic slide	DN 150
FR	flame protection valve	
GZ	biogas counter	0.5 - 30 m <sup>3</sup> /h
tl	el. thermometer	0 - 60° C
PP1	excess pressure protection	
T1, T2, T3	running dry protection	



		Maßstab	von	Zeichen	Maße
		Agricultural Biogas Plant			
		Flowscheme			
		Blatt: 01 Blattanzahl: 01 Blattgröße: A3 Blatttitel: 01			
		Blatt: 01 Blattanzahl: 01 Blattgröße: A3 Blatttitel: 01			

# Anaerobic Treatment of Food Residues



# Economy of Biogas Plants

- A Biogas plant can achieve economy of scale and net profit from selling electricity to the grid, with a capacity of more than 10 m<sup>3</sup> of manure per day.
- A treatment cost for a 60,000 tonnes Biogas plant is approximately \$42 per ton.
- Anatech<sup>®</sup> also has a mobile unit for small scale industries or farms.

# Summary

- Anaerobic Process is most suitable for organic waste with high moisture content.
- Energy is produced via fermentation process.
- This process produces Biogas and reduces greenhouse gas emission.
- Biogas is a high grade fuel gas, with an average calorific value of 25.3 MJ/m<sup>3</sup>.
- It also has by-products of organic fertilizer and feed, with high nutrient value.
- It enhances environmental stewardship.

- 
- 
- 

## Organic Waste and Wastewater Treatment in Biogas Plants

**Bio-System** was established in Konstanz, Germany in 1986. It has more than 22 scientists, engineers and researchers to focus on research and development of the latest environmental applications.

**Bi-Utec** and **Bio-System** are strategically partnered with **H<sub>2</sub>O Logics Inc.** to introduce and market the Biogas Plant.