



<p>Example Biogas Plant for Food Industry</p> <p>Doc.-No.: 042</p>	<div style="text-align: center;">  <p>PROBIOPOL Biogas Polygeneration for Romania</p> <p>Promoting and Supporting Implementation of Biogas-Polygeneration: A systematic Approach towards Sustainable Energy Consumption in Romania</p> <p>An official Project of the EC, founded from the Community's Sixth Framework Programme</p> </div>	<p>Project Coordinator</p>  <p>AGIMUS Umwelt Sicherheit Qualität</p> <p>Braunschweig, Germany</p>
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Example Biogas Plant for Food Industry

The Example is a Food-Industry Plant, producing fresh, frozen, cooked and tinned products from fish and meat. [490 Employees]

Actual Cost Situation:

Waste Treatment Costs Fat&Greases 1600 m ³ . 17,90 EUR / m ³	28.640,00 €
Waste Treatment Food wastes 1035 t. 16,80 EUR / m ³	17.388,00 €
Aerobic Treatment Liquid Wastes / Waste Water	311.000,00 €
el. Energy for Liquid Waste Treatment	45.000,00 €
Maintenance	28.000,00 €
labour costs	25.000,00 €

Total Costs for Treatment of digestible Substrates 455.028,00 €



- Liq. Treatment 620 m³/d
- Wastes 3,5 m³/d
- Fats 3,5 m³/d
- Need of Surface: 250 m²
- COD Ø incl. Cofermentate 5.600 mg/l
- Max. COD dayrate 3.500 kg/d
- Input-Temperature 30°C
- Capacity: 30 m³/h
- Volume: 600 m³, insulated
- Operating temperature: 35 - 38 °C
- Biogas yield: 53 m³/h

Photo: Envirochemie GmbH

Solution: Anaerobic Digestion instead of aerobic Waste treatment. Investment: 1.150.000 EUR

Amortisation	115.000,00 €
Interests (Financing)	69.000,00 €
NaOH (incr. pH)	8.000,00 €
N ₂	3.000,00 €

Maintenance (Full-Service)	28.000,00 €
labour costs	25.000,00 €
el energy for anaerobic Digestion: 200.000 kWh/a	18.000,00 €

Total Costs for Treatment of Digestible Substrates 266.000,00 €

Biogas 53 m ³ /h * 8760 h [m ³]	464.280,00 m ³
Energy Content 22,5 MJ/m ³ [MJ]	10.446.300,00 MJ
Energy content in kWh / a	2.901.750,00 kWh

Gain (Biogas used only for Heating) 87.052,50 €

Annual Benefit (Former Costs – New Costs + Gain) 276.080,50 €



Photo: Envirochemie GmbH

Solution: Anaerobic Digestion instead of aerobic Waste treatment. Investment: 1.650.000 EUR

- Liq. Treatment 620 m³/d
- Wastes 3,5 m³/d
- Fats 3,5 m³/d
- Need of Surface: 250 m²
- COD Ø incl. Cofermentate 5.600 mg/l
- Max. COD dayrate 3.500 kg/d
- Input-Temperature 30°C
- Capacity: 30 m³/h
- Volume: 600 m³, insulated
- Operating temperature: 35 - 38 °C
- Biogas yield: 53 m³/h

Plus
Polygeneration Plant 145 kW el.

Amortisation Anaerobic Digestion + 145 kW el Polygeneration Plant)	165.000,00 €	
Interests (Financing)	99.000,00 €	
NaOH (incr. pH)	8.000,00 €	
N2	3.000,00 €	
Maintenance (Full-Service)	29.017,50 €	
labour costs	15.000,00 €	
el energy for anaerobic Digestion: 200.000 kWh/a	18.000,00 €	
	337.017,50 €	
Biogas 53 m ³ /h * 8760 h [m ³]	464.280,00	m ³
Energy Content 22,5 MJ/m ³ [MJ]	10.446.300,00	MJ
Energy content in kWh / a	2.901.750,00	kWh
Polygeneration el. Energy yield 40 %	1.160.700,00	kWh
Polygeneration th. Energy (45 %)	1.305.787,50	kWh
Gain (el. current)	127.677,00 €	
Gain (th. energy)	39.173,63 €	
Annual Benefit	284.861,13 €	

Biogas is a very profitable business!