ProBioPol

Promoting and Supporting Implementation of Biogas-Polygeneration:

A systematic Approach towards Sustainable Energy Consumption in Romania

ProBioPol is an official Project of the EC, founded from the Community's Sixth Framework Programm
(Contract No. TREN/07/FP6EN/S07.73851/038387)

What is ProBioPol ?

PROBIOPOL
Biogas Polygeneration for Romania

- ProBioPol is an official Project of the EC, founded from the Community's Sixth Framework Programm (Contract No. TREN/07/FP6EN/S07.73851/038387)

- The project will enable the implementation of industrial biogas polygeneration in Romania and demonstrate energy autarchic companies reusing fermentable wastes for polygeneration.
- ProBioPol will be a kick-start of the biogas market in Romania. This form of product-related environmental protection will be very well transferable to more companies.

The ProBioPol Consortium

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Partic. No.	Participant name	Participant short name	Country
1	AGIMUS GmbH (Dr. Ralf Utermöhlen)	AGIMUS www.agimus.de	**Germany**
2	The Regional Environmental Center for Central and Eastern Europe – Country Office Romania	REC Romania	**Romania**
3	SC Project Developer SRL	ProDev	**Romania**
4	Asociatiei Generale a Inginerilor din Romania AGIR - filiala Cluj and filiala Sibiu Prof. Mircea Bejan Prof. Octavian Bologa	AGIR Cluj/Sibiu	**Romania**
5	Dragos Balan	Dragos Balan	**Germany**
6	target, Gesellschaft für Projektierung, Koordination und Öffentlichkeitsarbeit mbH	Target	**Germany**
7	BioKraft Karstädt GmbH & Co. KG	Biogas Brandenburg	**Germany**

What is Biogas ?

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Biogas is the gas that is the product of the digestion of organic materials under anaerobic conditions. Substrates such as manure, sewage sludge, municipal solid waste, biodegradable wastes or feedstock are transformed into methane and carbon dioxide.

Typical composition of biogas

- **Matter**
- **Methane, CH_4** 50-75 %
- **Carbon dioxide, CO_2** 25-50 %
- **Nitrogen, N_2** 0-10 %*
- **Hydrogen, H_2** 0-1 %
- **Hydrogen sulphide, H_2S** 0-3%
- **Oxygen, O_2** 0-2 % *

*often 5 % of air is introduced for microbiological desulphurisation

The process of **anaerobic digestion** is done by methane bacteria.

What can ProBioPol do for you?

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- Co-digestion of liquid and solid organic wastes in biogas plants is an integrated process. On the background of renewable energy production, the process includes environmental and agricultural benefits. It helps:
  - industrial companies to decrease costs in energy supply
  - industrial companies to decrease waste treatment costs
  - agricultural & industrial companies to make money of their wastes
  - engineers to gain best possible know-how
  - to get business opportunities
  - investors to find attractive investment opportunities

Example Food Industrie

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- 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

Investment: Biogas Plant with Polygeneration; 1.650.000 EUR

Annual Waste-Treatment-Costs before: 455.000 EUR

Annual Waste-Treatment-Costs with Biogas Plant: 337.000 EUR

Earnings from Polygeneration: 167.000 EUR

Annual Benefit: 285.000 EUR

Potential of Biogas in Romania

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The total estimated potential for biogas production from fermentable waste in Romania is estimated to be of **18.5 10^9. Nm^3/year of biogas**, with **111 TWh** energy content, which can supply 5923 MW el. installed power, producing 44 TWh el. and other 44 TWh th. net energy.

Potential of Biogas in Romania

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- One important aspect of this estimation is that it represents only the **theoretical available potential** (not always economically feasible). Technical and economical potential will have to be further investigated.

- To have a more realistic image on the significance of the biogas potential based on existing fermentable waste in Romania – we propose a step-by-step target development.

Potentials in Romania

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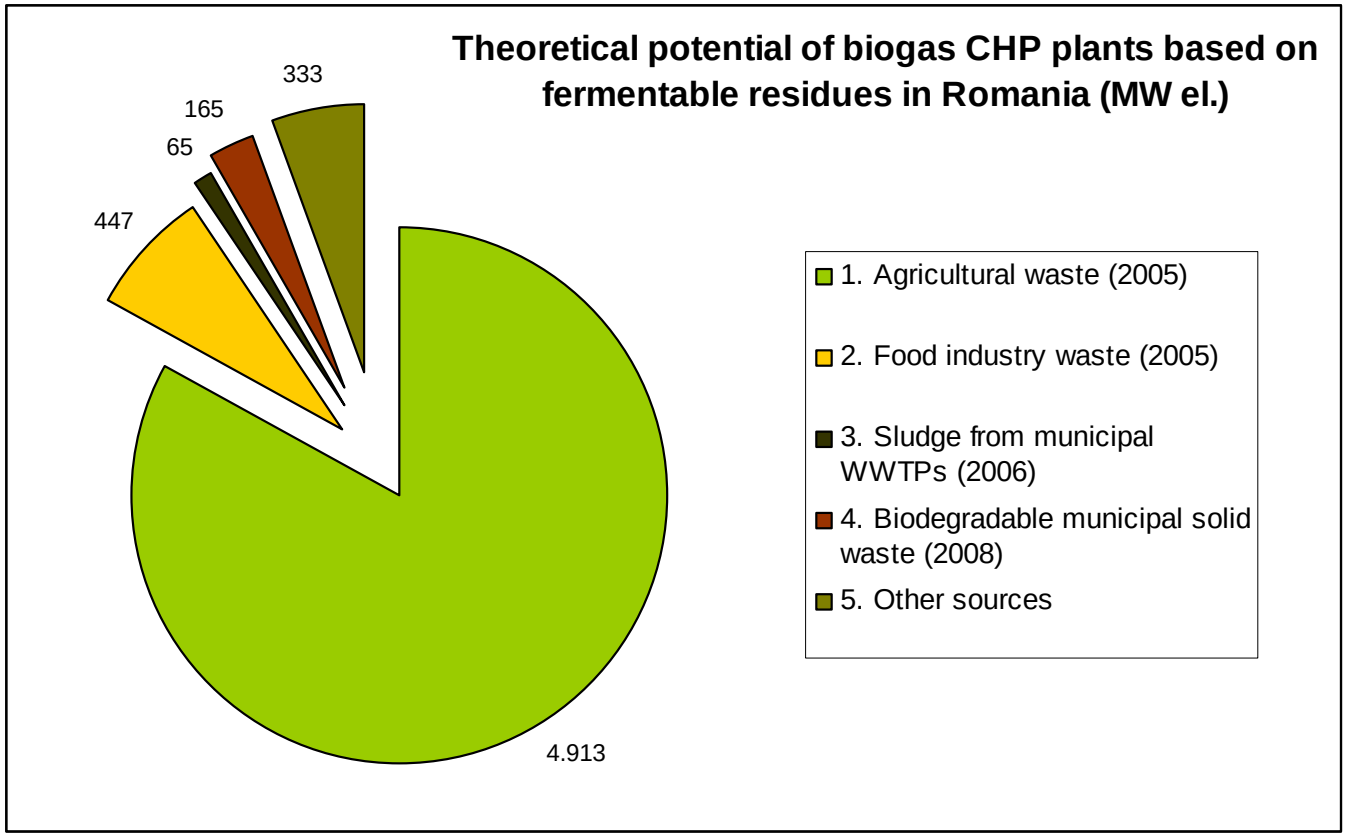

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Potential of Food Industry Waste

Industry	Nm3 biogas potential	MWh/y energy potential	MW installed potential
Fish & meat industry	8,8 mil.	52.800	2,8
Tinned and frozen vegetables	2,19 mil.	13.140	0,7
Oils and fats	390 mil.	2.340.000	124,8
Beverages, breweries, wine and spirits	60,5 mil.	363.000	19,4
Flours	38 mil.	227.850	12
Sugar	26 mil.	155.500	8,5
Diary	872,27 mil.	5.230.000	279
TOTAL – food-industry	1397,76 mil.	8.382.290	447,2

Potential of Biogas in Romania

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- How much this potential can contribute to the Romania's renewable energy targets?

- To answer this question, we used the existing national level targets for renewable energy, detailed in the National Strategy on Energy:

  - Even if only 8% of the **theoretical available potential are realized, the Biogas Contribution to the national Power consumption in Romania would be 4.2 % respectively 11% of the** National targets on RES in power consumption.

Steps in ProBioPol (2)

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Dissemination of know-how

- Creation of a expert- and consultant-network
- Workshop- and information campaign for industrial biogas-polygeneration to inform industrial companies about the opportunities by biogas use.
- Target: Capacity building and to convince industrial companies of the advantages of combined production of useful electricity, heat and cold by polygeneration.

Your Benefits

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Engineers / Consultants

Make yourself an expert, discover the possibilities and

→Join our 2-Day Formation

18. –19. March 2009

in SIBIU

(participation for free)

Benefits:

- ✓ Gain of state-of-the-art Know-how in Biogas Technology
- ✓ Receive an official Certificate of the EU-Project
- ✓ Learn to make feasibility-studies in biogas-technology
- ✓ Get new market opportunities as well formed consultant/engineer
- ✓ Become a member of an expert-and consultant-network

Your Benefits

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Industrial Companies / Agricultural Producers

You pay too much for energy, make yourself independent!

→ **Join our Worksop**

20. March 2009

in SIBIU

(participation for free)

Benefits:

- ✓ Gain of state-of-the-art Know-how in Biogas Technology
- ✓ Transform your waste in earnings!
- ✓ Discover the advantages of combined production of useful electricity, heat and cold by polygeneration
- ✓ Decrease your costs of Energy Supply
- ✓ Become a member of an expert network.

Your Benefits

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Those High-grade Formations do offer

- State-of-the-art Know-how in Biogas Technology and energy independence
- Real examples of cost/ benefits ratios
- Feasibility studies based on existing Biogas plants
- The opportunity to ask your technical questions to experts, who have years of experience in running biogas-plants
- To see 3-D models of biogas plants
- Information about the potentials and benefits of biogas-technology and energy independence
- Information about the technology and business opportunities
- Helping beneficiaries to meet operators and investors
- Training and capacity building (expert network)
- Inform about investment opportunities

Steps in ProBioPol (3)

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- The special challenge of the project is to identify a couple of companies, which are ready to run an fully integrated industrial biogas polygeneration plant at their site or near to their site.

- With a detailed economical investment study including financial options like contracting which can be presented to investors we will mobilize foreign capital. At the project's end, positive decision on installation of two large scale biogas polygeneration plants will have been taken. The results will increase the share of renewable energy use in Romania.

Thank you for your attention !